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The Open University

Doctorate in Education (EdD)

Thesis

A study of teaching assistants' engagement  
with a mathematics block of learning

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B.Ed (Hons), MA

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## **Abstract**

This study explores the learning experiences of students on a four-week block on mathematics as part of The Open University's Foundation Degree for primary teaching assistants. The key research questions seek to identify the outcomes and processes of the teaching assistants' study in relation to their work 'supporting' children's mathematical learning, and their wider experience as teaching assistants.

The study adopts an interpretivist, constructivist approach based on an illuminative evaluation framework (Parlett & Hamilton, 1972). A questionnaire gathered data from 67 students to provide a broad picture of their experience during the block.

Progressively focused telephone interviews were carried out with nine students using their written assignments, online forum posts and questionnaire responses as prompts to discussion. From the literature review I identified two potentially relevant areas of theory, in particular, Harland & Kinder's (1997) ordering of INSET outcomes, and Lave & Wenger's (1991) theory of 'legitimate peripheral participation'.

All nine teaching assistants identified positive outcomes from their study relating to their practice, in particular their increased confidence in mathematics as a subject, and ability to work with children in a fine-grained way to the extent that many aspects of their practice might be more accurately characterised as teaching rather than 'supporting' learning. A key finding concerned the ways in which the teaching assistants' study enabled them to develop agency as practitioners, and strengthened their participation in the professional life of their school. The study brought out how issues surrounding the learning of mathematics sometimes heightened the extent to which this occurred. Harland & Kinder's hierarchy of INSET outcomes and the notion of legitimate peripheral participation were found to be helpful concepts for understanding the outcomes of the block of study on the work of teaching assistants,

but were both identified as insufficiently nuanced to adequately characterise the diversity and complexity of their varied roles and individual career trajectories.

## **Acknowledgements**

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## **Glossary**

CPD	Continuing professional development
DISS	The Deployment and Impact of Support Staff project
EAL	English as an additional language
EDTA	The Effective Deployment of Teaching Assistants project
FD	Foundation degree
HEI	Higher education institution
HLTA	Higher level teaching assistant
INSET	In-service education and training
NCETM	National Centre for Excellence in the Teaching of Mathematics
Ofsted	Office for Standards in Education
OU	The Open University
PCK	Pedagogical content knowledge
PGCE	Post graduate certificate of education
QTS	Qualified teacher status
RECME	The Researching Effective CPD in Mathematics Education project
SEN	Special educational needs
SMK	Subject matter knowledge
SRPP	Student research project panel
STA	Specialist teacher assistant
TA	Teaching assistant



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# Chapter 1 Introduction

## 1.1 Rationale

This study explores the learning experience of teaching assistants studying The Open University (OU) module E207, *Subject knowledge and professional practice in primary schools*, a 60-credit level 2 module in the OU's Foundation Degree in Primary Teaching and Learning for teaching assistants. The specific focus of this study is the module's four-week block on mathematics (viz 'the block').

Since the mid-1990s teaching assistants have been deployed in increasing numbers to 'support' children's learning in primary schools in the UK, in part as a result of government policy (e.g. DfE, 1994; DfES 1997, 1998, 2002 & 2003). Over this time the literature relating to the role and contribution of teaching assistants has developed substantially. However, since Muijs & Reynolds (2003) called for more research into how teaching assistants might work alongside teachers more effectively to develop pupils' mathematical learning, research into the role of teaching assistants in primary mathematics has been sparse. Studies by Houssart (2005, 2011, 2012 & 2013 ) and Radford *et al.* (2011) provide valuable insights into aspects of teaching assistants' roles in mathematics lessons and the nature of their interaction with teachers and children, but there remains a need for further research, in particular into how to prepare primary teaching assistants for work in this area. Regarding training for teaching assistants in a wider sense, Brown & Devecchi highlight a 'paucity of studies that have looked at the relationship between TAs' training and its impact' (2013, p. 370).

Research (e.g. Henderson & Rodrigues, 2008; Barmby *et al.*, 2011) has identified mathematics as a subject in which anxiety, lack of confidence or poor pedagogical understanding in significant numbers of qualified primary teachers is of concern. My



work as a lecturer at the OU suggests that these issues present themselves in similar ways amongst teaching assistants. However, as I have moved from the role of class teacher and mathematics coordinator to become a teacher educator and writer of modules for teaching assistants, I have come to believe that thorough and engaging teaching that is sensitive to the strong affective response towards mathematics experienced by significant numbers of people can do much to address these issues. I believe that this approach can help to equip practitioners with the confidence and competence necessary to develop children's mathematical learning.

My own early experiences of mathematics were positive, but I began to struggle with formal algebra at secondary school. I found this aspect of mathematics very abstract, and felt inadequate sitting alongside friends who were able to quickly solve equations, while I looked on in confusion. It was later, in the first year of teacher training, that my confidence and attitude towards mathematics began to change. As a result of enthusiastic lecturers who encouraged a personal, investigative approach and presented mathematics as a creative subject that involved looking for and using patterns and links within and outside of mathematics, I became enthused and started to understand why the rote learning approaches I had experienced at secondary school had been unsuccessful for me. Consequently I chose to follow a mathematics specialism for the remainder of my teacher training, and I have maintained a particular interest in helping learners, both children and adults, to develop confidence and positive attitudes towards mathematics.

For teaching assistants undertaking the block, a distance learning work-based course of study, the relationship between the confidence, knowledge and understanding they acquire through their study, and how their workplace both contributes and responds to their learning and development, is complex. My motivation for carrying out this study was to explore the processes and outcomes of teaching assistants' work-based study of

mathematics in order to develop my understanding of the individual and socio-cultural factors involved, and in doing so to contribute to the existing literature on teaching assistants' learning and their capacity to work effectively in primary school classrooms, in particular relating to pupils' mathematical learning.

## 1.2 Research questions

This study set out to address the following two research questions:

- What are the ways, if any, of a work-based distance learning block of study on teaching assistants' confidence and attitudes towards mathematics, and their work supporting children's learning?
- What is the nature of the experiences that teaching assistants encounter as they study and draw on their new mathematical learning in their school practice and wider experience?

A key part of this study's rationale is to consider what might constitute successful or desirable outcomes for the block, and how their achievement might best be planned for and supported through course design and facilitation, in particular taking into account the nature of teaching assistants' participation within their settings.

The research questions aimed to 'understand what is happening' (Newby, 2010, p. 55) in terms of teaching assistants' experience and learning on the block. As such they fall under Newby's broad outline of an 'evaluation'. I have therefore positioned this study as 'evaluation research' (Cohen *et al.*, 2011; Bryman, 2012) but will use the term 'evaluation' from now on. Cohen *et al.* point out that there are similarities and differences, both conceptual and political, between research and evaluation, but that 'in practice, there is considerable blurring of the edges of the differences between the two' (2011, p. 52). The distinction between evaluation and research is explored in more

detail in Chapter 4, along with my rationale for the ‘illuminative evaluation’ framework (based on Parlett & Hamilton, 1972) that I developed for this study.

### 1.3 The E207 mathematics block

E207 is a distance learning module. It is a compulsory module in the OU’s Foundation Degree in Primary Teaching and Learning for teaching assistants, and also an optional module in the OU’s Early Years and Childhood and Youth qualifications. Students study the mathematics block for four weeks starting in the sixth of the module’s thirty-one weeks. They are expected to study for fourteen hours each week, five of which are allocated to school-based activities.

The learning outcomes for the block are for students to:

- ‘develop your understanding of key mathematical concepts and skills;
- explore ways of making children’s mathematical learning meaningful and stimulating;
- relate what you have learned to your observation of children working mathematically in school.’

(OU, 2013a)

Prior to starting the block students undertake a formative ‘Maths Audit’ to help them identify their ‘strengths and areas for development in mathematics, in the context of supporting learning in the primary classroom’ (OU, 2013b). As they work through the mathematics block, students are required to review their responses to the audit. This reflection is intended to help them decide, at certain points during the block, which aspects of a mathematical topic to focus on, for example by reading a particular chapter from the module reader, *Mathematics Explained for Primary Teachers* (Haylock, 2010). The block includes activities and readings covering the following areas of the mathematics curriculum:

- Number and place value
- Calculation
- Fractions, decimals, percentages, ratio and proportion
- Shape, space and measures
- Data handling

In addition, there are activities and readings on the following themes:

- Creativity in teaching and learning in mathematics
- Equity, diversity and inclusion in mathematics

During each week of the block students carry out online readings and interactive activities, and are also directed to read at least one chapter from the reader. Where appropriate they are directed to choose from a number of chapters under the broad topic areas set out above. Students are also encouraged to take part in a module-wide online mathematics discussion forum. For the cohort included in my research, I undertook the role of forum moderator. Students are additionally members of smaller ‘tutor group forums’, where they are able to interact with and receive support from their own tutor and immediate peer group.

Students are required to complete a ‘Maths Workbook’, which requires them to carry out or observe four activities with children in school, selected from a list of ten broad topic areas within the five areas outlined above, and to complete the following six sections in the workbook for each activity:

- Activity
- Children’s learning
- Key mathematical ideas and vocabulary

- Roles of resources / mental imagery
- Implications for subsequent planning
- References

Students are directed to draw on the activities and reading carried out during the block in their writing about school based activities. An extract from the workbook providing further details of the requirements for each of these sections together with an exemplar of a completed section is included in Appendix A. The workbook is submitted and assessed as part of students' assessment for the block.

Three key elements characterise the block's pedagogy and content. First, the block aims to enable students to develop in-depth understanding of mathematical concepts and techniques as opposed to learning by rote 'how to' carry out mathematical procedures. Second, it promotes and encourages students to engage in an investigative, enquiry-based approach to the subject. Third, the block explicitly acknowledges the affective dimension to learning mathematics experienced by many people, and encourages students to reflect on their own previous learning of the subject and to build confidence in their ability as mathematicians especially in relation to their work with children.

#### 1.4 Primary teaching assistants

The contribution of teaching assistants was first recognised nationally in the UK nearly fifty years ago in the Plowden Report (CACE, 1967), which identified three 'types of help' provided by 'teachers' aides' (the term in use at the time):

- An extra pair of hands for the teacher to provide individuals and groups of children with 'help in their play, their reading and other activities' (p. 330)

- Specialist help, e.g. ‘needlework, art and craft, gardening, games and swimming, drama, music (including acting as a pianist), library work and knowledge of children’s books’ (p. 330)
- Supervision of children between the end of the school day and collection by their parents

The report recommended the provision of ‘the equivalent of one full-time aide for 60 to 80 infants (two classes), and one aide for 120 to 160 juniors (four classes)’ (p. 331).

Since the Plowden Report, teaching assistants have become central figures providing what is commonly referred to as ‘support’ for children’s learning in primary schools within the UK. Until the mid-1990s the growth in numbers was steady (Adamson, 1999). In the two subsequent decades, however, the number of teaching assistants and other adults working alongside qualified teachers in primary classrooms increased rapidly. Two factors in particular were behind this growth. First, the move towards inclusive education led to schools appointing many more adults specifically to support children with complex learning and behaviour needs in mainstream classrooms. Second, in England, ‘workforce remodelling’ (the term used to describe initiatives introduced by governments since 2001 to address work–life issues for teachers), alongside the devolving of budgets to schools by local authorities and government, has resulted in schools employing increasing numbers of teaching assistants as a cost-effective way of providing support to classroom teachers.

By November 2014, the number of full time equivalent (FTE) teaching assistants in all nursery and primary schools in England had risen to 166,200 alongside a total of 215,500 equivalent FTE teachers (DfE, 2015), a ratio of approximately three teaching assistants to every four teachers. However, as many teaching assistants are employed on

a part time basis, it is not uncommon for the head count of teaching assistants in a school to outnumber that of teachers.

A distinctive feature of the primary school workforce as a whole in the UK is that it is predominantly female. Figures published by The World Bank reported that in 2013, 87 per cent of primary school teachers in the UK were female (World Bank, 2015). In England, a government report found that in November 2013, 92 per cent of teaching assistants were female (DfE, 2014, p. 6). This report did not distinguish between primary and secondary schools, but based on the students who have studied modules for teaching assistants at the OU, it seems likely that the percentage of teaching assistants in primary schools who are female may be greater.

As the numbers of primary teaching assistants have increased, the nature of their involvement for many has shifted away from ‘indirect support’ (e.g. producing materials, managing resources, record keeping) towards more ‘direct support’ (e.g. teaching or working with small groups or individuals) (Lee, 2003, p. 25). In England this shift gained additional momentum following the introduction of the National Workforce Agreement (DfES, 2003), which aimed to alleviate workload issues faced by teachers and led to the recruitment of additional support staff and introduced the Higher Level Teaching Assistant (HLTA) status. The requirements for assistants awarded this status included ‘lead[ing] some classes, or parts of classes, in their own right, within a system of supervision by a teacher’ (DfES, 2002, p. 23). These developments have led to the blurring of the distinction between the roles of teachers and teaching assistants in schools. Dillow, for example, observed that teaching assistants were often ‘being used in jobs that look like teaching’ (2010, p. 10). Blatchford *et al.* went further to identify that many of the teaching assistants observed in their study were in a ‘direct, instructional relationship with pupils’ (2012, p. 140). So, whilst teaching assistants are

commonly referred to as ‘support staff’, these observations suggest that, in some aspects of their practice at least, this ‘support’ may in fact constitute teaching.

However, the title of a recent set of recommendations published by the Education Endowment Foundation, ‘Making best use of teaching assistants’ (Sharples *et al.*, 2015), indicates that the discourse used by researchers in this area continues to subordinate the role of teaching assistants. These recommendations drew heavily on the findings of the Deployment and Impact of Support Staff (DISS) project (Blatchford *et al.*, 2012) and the Effective Deployment of Teaching Assistants (EDTA) project (Webster *et al.*, 2013). Three of the recommendations relate specifically to structured intervention programmes. Such programmes require practitioners to follow a script to ‘deliver’ the intervention and, for these, the inclusion of the word ‘use’ in the recommendations’ title may be considered acceptable, albeit that it positions teaching assistants as ‘resources’ rather than integral members of teaching teams. However, the remaining recommendations all stress the importance of ensuring that teaching assistants possess the necessary subject knowledge and skills to ‘play a direct instructional role’ (Sharples *et al.*, 2015, p. 18), and in this context, to talk of making ‘use’ of them seems dismissive of their contribution.

The growth in primary teaching assistant numbers prompted research into their continuing professional development (CPD), both in terms of identifying a growing need for it, and its availability and effectiveness (Bedford *et al.*, 2008; Webster *et al.*, 2011; Bignold & Barbera, 2012; Brown & Devecchi, 2013). These studies have focused on in-service training provided by schools and local authorities, which Morris describes as having developed from ‘relatively ad hoc, school-based, training to a more formalised programme of provision’ (2010, p. 483). However, since the late 1990s, higher education (HE) institutions have also played an important role in providing CPD for teaching assistants, in particular through the provision of foundation degrees. As



well as aiming to support CPD, foundation degrees have been viewed by many teaching assistants as a stepping stone to a full undergraduate degree, and often beyond that to attaining qualified teacher status (QTS) (Edmond, 2010; Morris, 2010). In many cases all or part of teaching assistants' foundation degree study is self-funded.

Since 1995, the OU has registered over 10,000 teaching assistants on work-based distance learning modules, initially through its now discontinued Specialist Teacher Assistant (STA) course, and since 2006 on modules that have formed part of the University's Foundation Degree for teaching assistants. Similar foundation degrees are offered by many other institutions throughout the UK. However, whilst there is evidence that such programmes have had a positive outcome for many teaching assistants in developing their pedagogical knowledge and understanding as well as their confidence, adaptability and skills, these outcomes have often not been matched by the extent of any increased involvement in supporting children's learning in the classroom (Hutchings, 1997; Swann & Loxley, 1998; Morris, 2009; Edmond, 2010).

Swann & Loxley's evaluation of the OU's STA programme attributed this disconnect between outcomes at a personal level and opportunities to incorporate these into classroom practice, at least in part, to the 'ad hoc manner' in which many teaching assistants were deployed at the time, and called for further research into the ways that 'professional boundaries between classroom assistants and teachers are defined and maintained in schools' (1998, p. 158). More recent research by Rubie-Davies *et al.* (2010) and Graves (2011 & 2013) suggests that defining the roles and status of teaching assistants in relation to teachers remains problematic, and therefore presents a challenge to 'educational managers in terms of developing a coherent school workforce' (Graves 2013, p. 95). More specifically, Rubie-Davies *et al.* identify the need for models of teaching effectiveness to take greater account of the roles and management of teaching assistants so as to develop 'more imaginative and informed ways of positioning the

pedagogical role of TAs relative to teachers' (2010, p. 446). On a more practical level, Brown & Devecchi (2013) found that a lack of systematic monitoring and accountability for teaching assistants in schools stood in the way of their effective deployment and career progression. Importantly too, teaching assistants themselves need to be able to contribute to the formulation of these approaches. Barkham's (2008) study, for example, supports findings going back to the 1990s that teaching assistants' voices often go unheard in educational debates and in strategic decision making. This is an issue that resonates with Devecchi *et al.*'s comparative study of support teachers in Italy and teaching assistants in England. The authors concluded that, in both countries, in addition to the need for effective training, there was a clear need 'to acknowledge and respect the work of support teachers as equally valuable members of the classroom' (2012, p. 182).

However, other factors undoubtedly have a bearing on the relationships between teaching assistants and their colleagues in school. For example, Morris found evidence of individual teaching assistants and their settings benefiting from the assistants' foundation degree study, but that such study often led to frustration including that arising from a 'lack of recognition and opportunity within their role to implement their learnt knowledge and skills' (2009, p. 321) and divisions between colleagues relating to the possession, or not, of particular qualifications. A further complicating factor is the considerable variation between schools and local authorities in how teaching assistants are deployed (Hancock *et al.*, 2010; Hammersley-Fletcher *et al.*, 2011).

### 1.5 Mathematics and primary teaching assistants

As alluded to earlier, concerns over the nature and quality of mathematics teaching in primary schools are longstanding, and there has been much debate (e.g. Ball, 1990; Goulding *et al.*, 2002; Rowland *et al.*, 2005, Ball *et al.*, 2008) about how to address

these issues. A helpful framework for thinking about the acquisition of ‘mathematics for teaching’ (Ball *et al.*, 2008) is offered by Shulman’s (1986) identification and definitions of subject matter knowledge (SMK) and pedagogical content knowledge (PCK). Shulman defines SMK as the ‘amount and organization of knowledge per se in the mind of the teacher’ (p. 9), and that PCK extends beyond this to ‘subject matter knowledge for teaching... in a word, the ways of formulating the subject and making it comprehensible to others’ (p. 9).

There is contradictory evidence as to how much emphasis should be placed on each of these in preparing practitioners to support children’s mathematical learning effectively. For example, Rowland *et al.* (2005) and Ball *et al.* (2008) identify a positive relationship between strong SMK and effective teaching practices, whereas Wilkins (2008) challenges the strength of the link between strong SMK and effective teaching. Wilkins’ research found that teachers with increased SMK were less likely to believe in enquiry-based teaching and more likely to favour a procedural or rule-based approach, especially if this was how they had been taught themselves. Wilkins suggests that teachers who were less successful at mathematics as children may have greater empathy with pupils due to having experienced how it feels to struggle with understanding mathematical concepts, and therefore be more open to a wider range of approaches. Houssart’s finding that the mathematics qualifications of teaching assistants are ‘almost always lower than those of teachers’ (2013, p. 1) does not mean that all of the individuals concerned struggled with the subject at school. Wilkins’ argument nevertheless suggests that many teaching assistants might be especially well disposed to help develop children’s mathematical learning, the more so because they are frequently deployed to work with small groups and individuals. However, whilst an understanding of how it feels to struggle at mathematics may be helpful in some important respects, this empathy needs to be accompanied by a secure grasp of what it is intended children

should learn and how to bring this about effectively. In this respect Houssart also points out that, unlike teachers, teaching assistants ‘have not benefitted from the consolidation of subject knowledge and introduction to mathematics pedagogy built into teacher education’ (2013, p. 1).

Although, of course, many teaching assistants will have participated in development activities within their school relating to mathematical subject knowledge and pedagogy, the block may provide a much more in-depth and potentially transformative programme of study than they are likely to have undertaken as part of any school-based CPD. This may result in teaching assistants taking what they view as ‘up-to-date ... professionally relevant knowledge’ (Edmond, 2010, p. 317) from their study back to the workplace, an issue that is discussed further in Section 2.3. The role of the workplace in teaching assistants’ learning from the block is central to the questions underpinning my evaluation, and therefore Rowland & Turner’s statement, which takes an explicitly socio-cultural stance, that when ‘trainee teachers take up teaching posts, it is the situation in which they work that has the greatest influence in changing their mathematical knowledge for teaching’ (2008, p. 1), in comparison to their learning during their period of training, seems an important area to explore in relation to the mathematics block.

Specifically in relation to mathematical SMK, the two teacher types outlined by Wilkins merit further consideration. For example, a teaching assistant who previously considered her SMK to be weak might, following her study of the block, bring enhanced confidence, understanding and a belief in enquiry-based learning (the approach to mathematics that underpins the block) to her work alongside a teacher with strong SMK and relatively rigid beliefs about the nature of mathematics and how it should be taught. This is one of many potential combinations of knowledge and beliefs about mathematics between two practitioners, and illustrates the complex dynamic

between identity, knowledge and practice. It also touches on the further dimension, emphasised by Goulding *et al.*, of beliefs about the nature of mathematics and how these ‘may be tied up with SMK in the way in which teachers approach mathematical situations’ (2002, p. 691).

Where available, literature relating to the role of teaching assistants and children’s learning in mathematics has tended to focus on their work with lower achieving pupils (e.g. Muijs & Reynolds, 2003; Houssart, 2005; Radford *et al.*, 2011), although arguably these are the pupils needing to be taught by the most highly qualified teachers.

Nevertheless, important dimensions of the teaching assistant role are highlighted in this literature. For instance Houssart (2005) identifies the value of observations made by learning support assistants in enhancing children’s mathematical learning, made possible by being located amongst a group of children whilst the teacher is in another teaching space. However, Houssart also notes how a teaching assistant’s willingness to offer feedback to the teacher can disintegrate if they feel their opinions are not valued or acted upon.

## 1.6 CPD in mathematics

Joubert & Sutherland (2008) were commissioned by the National Centre for Excellence in the Teaching of Mathematics (NCETM) to review the existing literature on CPD in mathematics to underpin its ‘Researching Effective CPD in Mathematics Education’ (RECME) project (NCETM, 2009). The scope of the review was the entire spectrum of CPD, not just short courses, with the authors describing teachers’ professional development as a ‘complex nexus of formal and informal experiences’ (p. 3).

Joubert & Sutherland found the literature generally critical of attempts to evaluate CPD, often due to a ‘lack of systematic and rigorous evaluation ... partly explained by the difficulty of finding suitable instruments or tools’ (p. 17). They found that changes in

teachers' practice appeared easier to investigate and were 'measured' more often than changes in pupils' learning. This finding is echoed in a more recent review of international literature on CPD for teachers across all curriculum areas, which attributed the limited use of student outcomes as a measure of effectiveness to the difficulty of establishing 'cause and effect between teachers participation in CPD and improvements in the attainments of their students' (Whitehouse, 2011, p. 10).

Joubert & Sutherland also contended that investigating outcomes relating to teachers' knowledge and beliefs is difficult because 'of the complexity of this knowledge, and because providing evidence of change requires information about the knowledge and beliefs of teachers both before and after their professional development' (p. 17). Whilst acknowledging the limitations arising from the small scale of my own evaluation, in developing its design I aimed to elicit data both on participants' knowledge, beliefs and practice prior to and following their study of the block, as well as on children's learning to the extent that this was possible.

In addition to considering the existing literature, Joubert & Sutherland's (2008) review, which is discussed further in Section 2.4, identifies the following areas as under-researched to date:

- the professional development of teaching assistants supporting pupils' mathematical learning in primary and secondary schools
- the difficulties teachers experience when they attempt to transfer knowledge between different settings: 'There is a tendency to assume that knowledge learned in professional development programmes is unproblematically transferred to the classroom.' (p. 29).

In both areas, my evaluation has the potential to add to existing theory and research.

The former is more general and relates to the overall scarcity of research on preparing

teaching assistants in relation to primary mathematics identified in Section 1.1. The latter is at the heart of my research questions, and relates directly to the sociocultural theories that I consider in seeking to explain my data. These are set out and discussed in the following chapter.

## 1.7 Overview of the thesis

The structure of the remainder of the thesis is as follows:

**Chapter 2:** provides a review of relevant literature to place the study within a wider theoretical framework, and inform the subsequent data analysis and interpretation.

**Chapter 3:** sets out and justifies the decisions taken in developing the study's methodology, and the methods that were used.

**Chapter 4:** gives a brief summary of the initial study, carried out in accordance with the EdD programme requirements, that preceded the main research study described in this thesis.

**Chapter 5:** reports and analyses the study's questionnaire data.

**Chapter 6:** presents an initial interpretation of the study's interview and documentary data with particular regard to the first research question's emphasis on the outcomes of teaching assistants' study of the block.

**Chapter 7:** builds on Chapter 6 to identify and discuss eight key themes that emerged through an in-depth thematic analysis of the interview and documentary data. This chapter focuses on the second research question's emphasis on study processes and the experiences of the participants.

**Chapter 8:** summarises the study's findings, and suggests implications for professional policy and practice. Recommendations are made for further research, along with a reflection on the study's design and methodological issues.

## **Chapter 2 Literature Review**

### **2.1 Introduction**

In Chapter 1, I outlined the context for my evaluation. This chapter aims to place the evaluation within a wider theoretical framework.

Section 2.2 explores a sociocultural view of learning because I believe that this area of theory is of central relevance to my study. In particular, Lave & Wenger's work on 'legitimate peripheral participation' and 'communities of practice' are discussed, concentrating on the extent to which these concepts might be helpful for understanding the engagement of teaching assistants with the block. Section 2.3 extends this discussion to consider the nature of work-based learning, and in particular the learning and experience away from their immediate role in school that teaching assistants bring to their workplace. Section 2.4 reviews literature concerning the evaluation of short experiences of training within the field of education as well as other disciplines. In Section 2.5, the nature of E207 as an online distance learning module is considered.

### **2.2 A sociocultural view of learning**

It may be tempting for governments and educationalists to place faith in the idea that teaching results in learning in an unproblematic way. In reality, though, the process is far from straightforward. In the specific example of teaching assistants' learning on a work-based module of study, many factors interact to influence how individuals experience the 'teaching' they receive and how and what they learn. A key element of sociocultural perspectives on learning is their emphasis on the role of the social and physical context in how individual learning occurs and meaning is created. For workplace learning, such perspectives imply that differences will occur between contexts. An individual's learning will be influenced by what they are able to do in the



situations and the people they find themselves amongst, as well as their own prior learning, experiences and attitudes. The term ‘situated learning’ was introduced by Lave & Wenger (1991), together with the related concepts of ‘legitimate peripheral participation’ and ‘communities of practice’, to address what they considered to be the limitations of the behavioural and cognitive theories of learning prevalent at the time. Lave & Wenger’s work aimed to address these perceived limitations, later summarised by Fuller as ‘downplay[ing] the role of learning as an integral feature of growing up, living and working with others in-the-world’ (2007, p. 17), by formulating ‘a theory of learning as a dimension of social practice’ (Lave & Wenger, 1991, p. 47).

In the previous chapter, literature highlighting the potential influence of the workplace on teaching assistants’ learning was introduced. In relation to this, the concepts of legitimate peripheral participation and communities of practice appear potentially helpful for analysing data on teaching assistants’ experiences of work-based learning, in order to help explain more widely how their knowledge and practice is acquired and used:

‘As an aspect of social practice, learning involves the whole person; it implies not only a relation to specific activities, but a relation to social communities – it implies becoming a full participant, a member, a kind of person.’

(Lave & Wenger, 1991, p. 53)

Since Lave & Wenger’s original monograph was published in 1991, their ideas have been critiqued and developed by many, including Lave & Wenger themselves, as discussed in the remainder of this chapter. The concepts of legitimate peripheral participation and communities of practice are inextricably linked. However in attempting to relate them to the experiences of students studying the block, I have found it helpful to consider each in turn.

### 2.2.1 Legitimate peripheral participation

Lave & Wenger present a view of learning as ‘the construction of identities’ that:

‘... only partly – and often incidentally – implies becoming able to be involved in new activities, to perform new tasks, to master new understandings.’

(Lave & Wenger, 1991, p. 53)

Lave & Wenger’s model contends that people learn through their ‘increasing participation in communities of practice’ (p. 49) as they move towards full membership. In setting out what they mean by ‘legitimate peripheral participation’, Lave & Wenger:

‘... draw attention to the point that learners inevitably participate in communities of practitioners and that mastery of knowledge and skill requires newcomers to move toward full participation in the sociocultural practices of a community.’

(Lave & Wenger, 1991, p. 29)

In developing their model, Lave & Wenger considered five ‘craft or craft-like’ (p. 62) apprenticeships, consciously avoiding any school-related examples in order ‘above all to take a fresh look at learning’ (p. 39) so as to ‘develop a view of learning that would stand on its own’ (p. 40) rather than one ‘tied in various ways to school instruction and to the pedagogical intentions of teachers’ (p. 61). Downplaying ‘pedagogical intentions’ is seemingly linked to Lave & Wenger’s desire to stress that legitimate peripheral participation is ‘not in itself an educational form, much less a pedagogical strategy or a teaching technique’ but rather ‘an analytical viewpoint on learning, a way of understanding learning’ (p. 40).

Lave & Wenger state that they opted for the term ‘full participation’, as opposed to ‘central’ or ‘complete’ participation, to describe what legitimate peripheral participation

leads to, in order to ‘do justice to the variety of relations involved in varying forms of community membership’ (1991, p. 37). In relation to the teaching assistants in my evaluation, this distinction between ‘full’ and ‘central’ or ‘complete’ prompts consideration about what forms of ‘community membership’ might be available to or achievable by them, and what might for them constitute full, or partial participation. Notwithstanding that individual teaching assistants may belong to multiple communities of practice, especially if they additionally do other paid or voluntary work, the schools and in particular the individual classrooms in which they work may be the most important communities in the context of their learning on the block. It therefore seems valid to consider the extent to which the teaching assistants in this evaluation think of themselves as aiming towards ‘full participation in the socio-cultural practices’ (Lave & Wenger, 1991, p. 29) of their whole school or classroom community and what influence, if any, their learning from the block has on this process. A potential answer is provided by Edmond’s research into teaching assistants’ foundation degree study, which found that they claimed ‘an “intermediate” identity (not a teacher but “more than a TA”)’ (2010, p. 314). Morris (2009) and Rubie-Davies *et al.* (2010) describe similar distinctions in how teaching assistants perceive their status and pedagogical role relative to teachers. These studies suggest that there may be a sense in which some teaching assistants develop ‘communities of practice’ that are separated from those of teachers, and that these teaching assistant ‘communities’ reflect their own pedagogies as opposed to those of qualified teachers, albeit with some overlap. That is to say, ‘full participation’ to a particular teaching assistant may be perceived differently to what he or she considers constitutes ‘full participation’ for a qualified teacher. Furthermore, ‘full participation’ may be perceived differently even between teaching assistants, determined by factors such as their levels of motivation and confidence, what they want

to get out of their role on a day to day basis, as well as their longer term career aspirations.

Another notion of how teaching assistants might be positioned is provided by Howes' review of literature about the impact of support staff in mainstream schools, which identified a body of research that contended that:

‘... support staff do extremely important work in the spaces left by the structures and formalities of schooling.’

(Howes, 2003, p. 150)

Howes relates his research explicitly to the ‘wider sociocultural issues’ (p. 150) that affect pupils’ participation and learning. An image conjured up here is of teaching assistants forming a human glue that fills some of the pedagogical spaces that teachers are unable to attend to, thereby holding together a school’s structures and formalities. There is perhaps an implication in Howes’ comments that this work is ‘important’ because it provides the cohesiveness that enables schools to function in a way that is meaningful for their pupils. However there is also a sense that in fulfilling this purpose, teaching assistants are positioned outside of the formalised ways that schools operate, with potentially an effect on the extent to which they feel included and that their participation is valued. Over a decade on from Howes’ review of the literature, my evaluation of the block offered an opportunity to explore how far the notion of teaching assistants working in these in-between pedagogical spaces might still be appropriate.

Participation is one aspect of Lave & Wenger’s concept of legitimate peripheral participation. The other, ‘legitimate peripherality’ seems similarly a potentially helpful way of understanding teaching assistants’ experiences of learning on the block. In providing a rationale for their choice of terms, Lave & Wenger do not go into precise detail about what might make peripherality in a given community of practice

‘legitimate’. However, they do stress that legitimacy should not be viewed as a separate element, but that the concept should be taken as a whole:

‘Each of [legitimate peripheral participation’s] elements is indispensable in defining the others and cannot be considered in isolation. Its constituents contribute inseparable aspects whose combinations create a landscape – shapes, degrees, textures – of community membership.’

(Lave & Wenger, 1991, p. 35)

Similarly, peripherality is conceptualised as a fluid concept that suggests there are:

‘... multiple, varied, more- or less-engaged and –inclusive ways of being located in the fields of participation defined by a community.’

(Lave & Wenger, 1991, p. 36)

There is a sense here that participation of almost any nature might be considered to have legitimate peripherality, the only condition being that it is determined by the community. In respect of teaching assistants, however, Graves’ (2013) study (discussed later in this section) introduces the notion that individual participants may also be able to determine the legitimacy of their participation.

As already indicated, the concept of legitimate peripherality is complex, and Lave & Wenger’s explanation brings out how it is ‘implicated in social structures involving relations of power’ and how this might, but does not necessarily, result in negative consequences:

‘As a place in which one moves towards more-intensive participation, peripherality is an empowering position. As a place in which one is kept from participating more fully – often legitimately ... it is a disempowering position.’

(Lave & Wenger, 1991, p. 36)

For teaching assistants, a key question is what do they, as individuals, consider an achievable or professionally fulfilling level of participation? However, even when they feel that they have been effective in their role, how teaching assistants perceive their participation could be undermined by the way it is presented in the wider ‘official’ narrative relating to their work. Hancock & Eyres, in their discussion of two influential official evaluations by the Office for Standards in Education (Ofsted) of the implementation of the National Literacy and National Numeracy Strategies (DfEE, 1998; DfEE, 1999), argued that the evaluators presented the contribution of teaching assistants to the implementation of the strategies as ‘peripheral’ and that of teachers as ‘core’ (Hancock & Eyres, 2004, p. 223) in spite of acknowledging within the reports that teaching assistants had provided valuable and substantial support as effective members of teaching teams.

Over a decade on from these evaluations of the national strategies, the status and roles undertaken by teaching assistants continue to evolve, as discussed in Section 1.4.

Another view of teaching assistants on the periphery is offered by Graves’ research conducted with fifteen HLTAs working in primary, secondary and special schools in the north of England, which found that the roles of individual HLTAs had developed in a ‘locally devised, contextually contingent, organic [way] ... at odds with current policy’ (2013, p. 101). Graves identifies drawbacks to this situation in denying teaching assistants the advantages and sense of belonging to a wider collective of professionals. However, the HLTAs in Graves’ study stated that they valued and appreciated the unstructured and adaptable nature of their roles because it allowed them greater scope to develop their own involvement in alignment with their own strengths and interests. They viewed this as advantageous in comparison to what they perceived as the much more rigid roles and responsibilities of qualified teachers. The participation they describe might therefore be characterised as self-defined legitimate peripherality. It is

not clear from Graves' article, however, whether these more individualised trajectories were experienced to a lesser or greater extent in each of the three types of settings from which the participating HLTAs were drawn.

Both Graves' (2013) depiction of teaching assistants on the periphery and Hancock & Eyres' (2004) portrayal of teaching assistants doing core classroom work present different models to Lave & Wenger's (1991) view of participation, which Fuller states has been criticised for focusing only on 'that experienced by legitimate peripheral participants engaged on an 'inbound' journey from new-comer to old-timer in a community of practice' (2007, p. 25). In relation to my evaluation, Lave & Wenger's (1991) concept of legitimate peripheral participation might be considered as not directly comparable to the learning journeys of most teaching assistants in that each of the five different models of apprenticeship presented by Lave & Wenger is characterised by the journey from new-comer to eventually assuming the role of old-timer. Even for the significant number of teaching assistants studying the block who aspire to become teachers, a key difference between their journey and those of the apprentices discussed by Lave & Wenger is that the teaching assistants' journeys are less clear-cut transitions from new-comer to old-timer. Rather they follow a path that deviates for a considerable length of time via a different role (that of teaching assistant), albeit that role is related to and overlaps, sometimes considerably, with that of the teacher they ultimately aspire to become.

In respect of the five apprenticeships explored by Lave & Wenger, it seems significant that the one they consider 'often doesn't work' (1991, p. 65) – meat cutters in U.S. supermarkets – is the one arguably most similar to the position of teaching assistants studying the block. The butchers' apprenticeship is described as 'a mix of trade school and on the job training' (Marshall, 1972, p. 42 cited in Lave & Wenger, 1991, p. 77),

whereas in the other examples ‘teaching’ is on more of a ‘master-apprentice’ basis and more integrated into the workplace, or in the case of the Yucatec midwives:

‘Apprenticeship happens as a way of, and in the course of daily life. It may not be recognized as teaching at all.’

(Jordan, 1989, p. 932 cited in Lave & Wenger, 1991, p. 69)

A central problem experienced by the meat cutters as identified by Marshall was the lack of relevance and currency in what was taught in trade school to the practice that the apprentices experienced in the supermarket. As discussed later in Section 2.3, this may not necessarily be the case for teaching assistants studying E207, although in evaluating the block it seems important to attempt to identify the extent to which individuals found its teaching relevant to their work in school.

Lave & Wenger’s analysis draws out ways in which some forms of apprenticeship can result in learning occurring without any formal or organised teaching taking place. However they also felt compelled to include reference to the earlier work of Becker (1972) who contended that apprenticeship was a more effective way of learning than school but that in contradiction to the examples discussed in Lave & Wenger’s work:

‘... teaching is central to learning through apprenticeship; and that apprentices, individually, must organize their own learning “curriculum” and recruit teaching or guidance for themselves.’

(Lave & Wenger 1991, p. 86)

The teaching referred to by Becker is that provided by colleagues in the workplace, with recruitment being of ‘people who know more than [the apprentice] does [and who] must be persuaded to assist him’ (Becker, 1972, pp. 95-96). Although arguably not fully apprentices in the sense of any of Lave & Wenger’s examples, teaching assistants



studying the block similarly need to enlist the help of teachers in their schools in order to carry out the school-based tasks necessary for completing their study successfully. However, this help may for some be concerned with gaining the necessary access to carry out activities and observations, and not necessarily include teaching or providing guidance. In a wider sense, though, by initiating their own study with the OU, these teaching assistants can be considered to have taken responsibility for organising their learning to an impressive extent. They might even be considered to have organised their own equivalent (i.e. teaching provided by OU modules) of the ‘trade schools’ that Becker critiques in his article.

Becker’s unfavourable analysis of the efficacy of these schools should be viewed cautiously given his admittance that his conclusions are based on a ‘brief and selective review’ of a body of evidence that is ‘both too vast to master and too scanty to allow firm conclusions when the great number and variety of schools is taken into account’ (1972, p. 86). Further, the detail and length of Becker’s analysis make it difficult to summarise concisely. Nevertheless, it is worthwhile to reflect on how far some of the limitations of trade schools put forward by Becker might, or might not, be leveled justifiably at the block.

A key criticism by Becker concerns the potential complexity of what is taught, both in terms of the subject matter, which he considers schools may simplify to prevent students from ‘flounder[ing] unnecessarily’ (p. 87), and in relation to ‘the social situation the student will later use his knowledge in’ (p. 88). In respect of the former, whilst the block does aim to develop the subject knowledge of teaching assistants, some of whom may lack confidence and be anxious about the content, it does so with the intention of enabling them to develop a full understanding of mathematical concepts as opposed to simplifying the content. What may differ from the scenarios envisaged by Becker is that the block explicitly sets out not to replicate the rote learning approaches

that may have led to some of the teaching assistants in this evaluation to believe that being good at mathematics was beyond their capabilities.

Becker's reference to the social context is noteworthy. His concerns are about how techniques (e.g. haircutting) taught in a trade school, when carried out inexpertly by inexperienced students, might be reacted to by customers. Research within education (e.g. as summarised by Robinson, 2014) confirms that primary school pupils are able to form perceptive views about the quality and relevance of the teaching they experience. Therefore, whilst in theory teachers will rightly want to monitor the work of teaching assistants, the teaching assistants in this evaluation are likely to have already built relationships with the pupils and teachers they work alongside as they seek to apply what they have learnt from the block. It would be hoped that in most cases such relationships would be supportive and therefore less likely to result in the kind of conflict described by Becker. However, for some teaching assistants, implementing approaches that are new to them, and possibly to the school, might not turn out to be trouble-free.

Becker also contends that the curriculum offered in trade schools can be insufficiently flexible to meet the needs of individual students. It seems likely that in the decades since Becker's article was published, provision across most sectors of education and training has become more inclusive and responsive to an increasingly wide range of learning needs. However, how far individuals consider the learning experiences offered to them to be meaningful and productive remains an important measure to consider in any evaluation.

Becker's (1972) observations about the quality of teachers in trade schools are especially scathing:

‘... competent practitioners in a subject area know only by accident, if at all, the skills of teaching.’ (p. 88)

He also questions the currency and relevance of teachers’ knowledge due to the length of time that may have elapsed since they were last active in the relevant trade. However, whilst the teaching assistants in my evaluation will be the ultimate judges of the quality of teaching offered by the block, another difference potentially in the block’s favour is that the authors of E207 are experienced qualified teachers who, through their current work, maintain regular contact with practice in primary schools. Admittedly, though, this does not usually involve hands-on classroom practice.

Lave & Wenger’s original (1991) view of participation has been criticised for focusing only on the journey from new-comer to old-timer (see Fuller, 2007). In response Wenger (1999) subsequently acknowledged the existence of a wider range of ways of participation in workplace learning by identifying the five trajectories set out in table 2.1 below.

**Table 2.1 Types of trajectory**

<b>Type of trajectory</b>	<b>Description</b>
Peripheral	By choice or by necessity, never leads to full participation, yet provides access to a community and its practice that becomes significant enough to contribute to one's identity.
Inbound	Newcomers have the prospect of becoming full participants in a community, even though their present participation may be peripheral.
Insider	Formation of an identity does not end with full membership. Evolution of the practice continues.
Boundary	A trajectory that finds its value in spanning boundaries and linking communities of practice.
Outbound	A trajectory that leads out of a community, as when children grow up.

(Adapted from Wenger, 1999, p. 154)

Although the trajectories set out by Wenger are potentially helpful for explaining the data in my evaluation, the existing literature suggests that attempting to categorise the trajectories of individuals or groups of teaching assistants is likely to bring to light further complexities. For example, the roles of teaching assistants described in the official evaluations discussed by Hancock & Eyres (2004), discussed earlier, are presented by the evaluators in such a way that may appear consistent with Wenger's characterisation of a peripheral trajectory. However, Hancock & Eyres argue that in supporting the implementation of the government's national strategies in the early 2000s, teaching assistants were in fact doing core classroom work, but that the importance of this 'participation' was not fully recognised by the evaluators. Hancock and Eyres attribute this to the desirability, for political purposes, for teaching assistants

to continue to be thought of as peripheral. It may also be seen as a result of the language repeatedly used, both professionally and more widely, to describe the respective roles of teachers (who 'teach') and teaching assistants (who 'support'), thereby contributing to the marginalisation of teaching assistants. The assistants in Graves' (2013) more recent research, however, whilst in some respects restricted to the periphery of both their school as well as the wider 'community' of teaching assistants, might also be seen as forging an unmapped trajectory towards their own unique category of membership.

Fuller (2007) has further challenged the concept of novice and expert presented by Lave & Wenger as being over-simplistic in that there are some tasks (and increasingly those involving new technologies) in which an apprentice may have greater expertise than the more experienced colleagues they work alongside. In her exploration of what trainee teachers might bring to their teaching practice schools (as communities of practice), Woodgate-Jones (2012) has put forward the concept of the 'skilled newcomer', represented by student teachers bringing in new ideas and skills. However, whilst identifying the benefits that a 'skilled newcomer' might be able to bring to a school, Woodgate-Jones states explicitly that her paper 'is not claiming that student teachers are anything other than apprentices and legitimate peripheral participants whilst on school placement' (2012, p. 156). For the student teachers on the PGCE (Post graduate certificate of education) programme in Woodgate-Jones' study, this statement is arguably not entirely valid. On the one hand, since the aim of these students was ultimately to achieve qualified teacher status, they might be considered to be on an inbound trajectory towards full membership of the teaching profession (as a wider community of practice), although it is perhaps the qualification itself rather than the practice of 'old-timers' that they are striving towards. However, as Yandell & Turvey point out, although 'there is much about the PGCE year that can be accommodated within the model of legitimate peripheral participation developed by Lave & Wenger'

(1991, p. 544), within their placement schools – in contrast to their position once they become fully qualified teachers – they to some extent remain on the periphery, ‘allowed to maintain a distance – to participate but also to draw back, to act but also to look on’ (2007, p. 544).

In a similar way to the student teachers in Woodgate-Jones’ research, teaching assistants studying the block may find that they have opportunities to introduce new ideas and skills to their own practice and that of the teachers they work with. In terms of relevant knowledge and prior experience, however, they will in many cases not be newcomers. For example, the HLTAs interviewed in Hancock *et al.*’s study brought to their roles, learning from qualifications in areas such as childcare and early years professional practice, teaching, classroom support and educational psychology. The interviews also uncovered:

‘The extent to which subject knowledge and understanding of a curriculum area (for immediate classroom teaching purposes, at least) could be equivalent to that of a qualified teacher.’

(Hancock *et al.*, 2010, p. 103)

So, for some of the teaching assistants studying the block, it may be that the qualifications they are working towards provide the most powerful underlying motivation for their study, rather than the need to further develop their own knowledge and practice. Furthermore the type of trajectory they are on may have already been firmly established. For example, a school may be aware of an individual teaching assistant’s aspiration to qualify as a teacher (and possibly keen to subsequently employ them as such), and this may potentially provide them with good opportunities to make use of their new ideas and skills. Another possibility is that, as a result of their potential

new contributions arising from their study, a school might begin to view a teaching assistant differently, and in so doing their type of trajectory may begin to change.

### 2.2.2 Communities of practice

Lave & Wenger (1991) introduced the term ‘community of practice’ as ‘a set of relations among persons, activity, and world, over time and in relation with other tangential and overlapping communities of practice’ (p. 98). Within such communities of practice, learning is therefore seen as a social process. However, the concept of a community of practice was developed in only a limited way in Lave & Wenger’s original work, and Wenger (1999) subsequently developed it in much greater depth.

Wenger points out that not every entity described as a community (for example, a local neighbourhood) can be considered a community of practice. He defines a community of practice as one in which social interactions take place as a result of the practice that brings the members of the community together. He sets out three dimensions of practice ‘by which practice is the source of coherence of a community [of practice]

1. Mutual engagement
2. A joint enterprise
3. A shared repertoire.’

(Wenger, 1999, p. 72)

Wenger draws on the example of a claims processing department in setting out the characteristics of each of these three dimensions. An important aspect of my study was to explore how far Wenger’s concept of communities of practice might also be useful in considering the experiences of teaching assistants, and the situations in which they work and learn. In the paragraphs that follow, consideration is given to each of the dimensions set out by Wenger in relation to two of the main locations, one real and one

that is part real, part virtual (i.e. online), in which the learning of the teaching assistants in this study takes place, their school and their OU study.

In respect of the first dimension, Wenger states that mutual engagement involves:

‘... being included in what matters... In order to be a full participant it may be just as important to know and understand the latest gossip as it is to know and understand the latest memo.’

(Wenger, 1999, p. 74)

Within their school, individual teaching assistants might be seen as belonging to more than one community of practice, for example the whole school, a group of teaching assistants within the school, or perhaps even the teaching team within a particular classroom (potentially just two people – class teacher and teaching assistant). ‘What matters’ to an individual teaching assistant and how far they feel included in this may vary between each of these ‘communities’, and will be determined partly by the trajectory an individual is on. In relation to teaching assistants, Wenger’s reference to ‘gossip’, an informal aspect of social interaction at work is noteworthy. In some schools all staff, including teaching assistants, are well integrated in the staffroom. This is not always the case, however, and some teaching assistants may have little time for informal social conversations with colleagues, and with teacher colleagues in particular. Therefore for some teaching assistants, ‘what matters’ within their own community of practice may be much more focused on their work with children (or, to draw on Wenger’s analogy, understanding the latest memo) and much less about the ‘gossip’.

Within the OU, the students in this study may similarly consider that they belong and, at times, move between more than one community of practice, although perhaps a more appropriate title for their study-related communities would be ‘communities for *thinking* about theory and practice’. During their study of the block they will be a member of an



online tutor group of approximately twenty people as well as having access to the online mathematics forum, potentially a study community of over 300 students. In his discussion of the viability of virtual communities of practice, Jewson proposes that a key question is ‘whether the medium of electronic communication is too “thin” to bear the weight of the “thick” messages of communities of practice’ (2007, p. 156).

Although Jewson’s analysis concerns office work in contrast to the teaching assistants’ study-related communication, two of his points in particular may be relevant to this evaluation. First, the view that although technology has the ability to take the place of face-to-face interaction in ‘distributed communities of practice’ (Wenger *et al.*, 2002) (i.e. those which are geographically dispersed) it is harder, although not unachievable, for online communication to ‘fully convey tacit aspects of informal contacts’ (Jewson, 2007, p. 158). As already suggested, informal social interactions can be important for engendering a sense of belonging to a community of practice, and this evaluation offered an opportunity to explore the extent to which the teaching assistants studying the block feel that interactions of this nature are a possible and, indeed, desirable element of their study. It is worth noting that some students studying the block may also be members of other groups consisting of people they have met either online or face-to-face during their study of previous modules, and that these relationships may have already developed socially beyond the immediate study context.

Second, Jewson identifies that a less frequently recognised issue in respect of virtual communities is how communication is ‘always contextualized in real time and space for those involved’ and may be read and responded to ‘...at a desk, on a train, in a hotel lobby... on a beach, at a party or in a car’ (2007, pp. 160-1). Although Jewson is referring to communication via email and text messages, it seems reasonable to conjecture that a similarly wide range of locations together with their inherent constraints might apply to teaching assistants in their engagement in the online tutorials

and forums that form a central part of their study on E207. In the context of office work, Jewson identifies the need for research to ‘excavate the significance of real time/space contexts for virtual encounters’ (p. 161). A similar excavation in relation to teaching assistants studying the block may be relevant to this evaluation, although in the context of study, the need for urgent access and the facility to respond promptly seem likely to be less important.

Wenger’s second dimension, joint enterprise, is about what keeps a community of practice together. First, he emphasises how joint enterprise within a community of practice occurs as the result of negotiation:

‘The enterprise is joint not in that everybody believes the same thing or agrees with everything, but that it is communally negotiated.’

(Wenger 1999, p. 78)

Wenger was writing specifically about the need for claims processors to make the enterprise ‘real and livable’ by negotiating a way of working together that accommodates any differences and brings together the participants’ ‘respective aspirations’ (p. 79). The close teamwork required for teaching assistants to work effectively within teaching teams and the issues arising from how they perceive their status and role in relation to teachers (Morris, 2009; Edmond, 2010; Rubie-Davies, 2010) have been discussed earlier. An important consideration for this evaluation, therefore, is how teaching assistants might negotiate a ‘real and livable’ relationship with school colleagues in relation to their work-based study.

A further element of joint enterprise put forward by Wenger, is how it is defined by the participants themselves and therefore belongs to them ‘in a profound sense, in spite of all the forces and influences that are beyond their control’ (p. 77). He states that the result of this is that:

‘... the enterprise is never fully determined by an outside mandate, by a prescription, or by any individual participant.’

(Wenger, 1999, p. 80)

There are echoes in this characterisation of how the teaching assistants in Graves’ (2013) study, also discussed above, were able to exercise personal agency within both their own schools and the wider policy context, a theme that is developed later in this section.

Finally, in respect of joint enterprise, Wenger contends that this requires ‘mutual accountability that becomes an integral part of the practice’ (p. 78). Wenger outlines how this concerns not only the enterprise itself (i.e. claims processing in his example or, for teaching assistants, helping children to learn) and the way this is reified through the requirements of the work, but also aspects such as:

‘... being personable, treating information and resources as something to be shared, and being responsible to others by not making their lives more difficult.’

(Wenger, 1999, p. 81)

The sense that these characteristics are soft, almost even hidden, aspects of the relationships between community members resonates strongly in the context of the close working and learning relationships within teaching teams in schools. Wenger proposes that the significance of such features of practice is at least equal to those aspects of accountability that are reified, a view that chimes with my own experiences working alongside teaching assistants as a primary school teacher, and subsequently as an observer of the interactions between teachers and teaching assistants in classrooms. Nevertheless, it seems important to explore how the workplace demands and requirements of teaching assistants’ study of the block might enhance or perhaps disrupt such features that been developed carefully, and often tacitly, over time.

The concept of joint enterprise appears less relevant to teaching assistants' membership of their E207 cohort, since the necessity for 'community coherence' (Wenger, 1999, p. 77) may not be as strong. This 'community' has the potential to support teaching assistants significantly in their study, and the enterprise is joint in that students have the module materials in common along with the goal of completing their study successfully. In another sense, though, each individual teaching assistant is finding their own way through the block, and indeed a number of them may choose to do so in a largely solitary way. For these students, their study may feel more individual rather than a sociocultural enterprise. Nevertheless, in their online and face-to-face interactions, many students may find themselves negotiating the extent and nature of their involvement with others and operating in a spirit of mutual accountability, although perhaps in a less intense and centrally important way compared to their relationships in school.

Wenger's final dimension of practice as a source of community coherence, shared repertoire, is described as including

‘... routines, words, tools, ways of doing things, stories, gestures, symbols, genres, actions, or concepts that the community has produced or adopted in the course of its existence, and which have become part of its practice.’

(Wenger, 1999, p. 83)

These are resources, built up over time, that help bring about coherence to the practice within a group as a means for negotiating meaning. Wenger's notion is that, although such resources are useful in 'reflect[ing] a history of mutual engagement', they can also 'be re-engaged in new situations' (p. 83). Wenger goes into less detail about 'shared repertoire' than with the previous two dimensions, and his exposition of how 'well-established interpretations' might be 're-utilized to new effects' (p. 83) remains very

abstract, making its potential relevance to this evaluation difficult to identify in advance of gathering the data.

### 2.2.3 Agency

Examining Lave & Wenger's work as a whole, Fuller (2007) contends that they have not attributed sufficient credit to the ability of communities of practice to transform themselves. Hager (2004), without directly referring to Lave & Wenger's work, alludes to this in stating that participation in itself is not enough to ensure that learning takes place. Indeed, he considers that some organisations may be set up to resist change. One can hope that this is not the case for the schools employing the teaching assistants in this evaluation. However, there may be instances in which individual teaching assistants find themselves having to follow rigid instructions with little or no scope to influence and inform practice, despite their learning from the block. Drawing on the work of Sfard (1998), Hager suggests that as a metaphor 'participation accounts less well than construction for change' (2004, p. 29). In setting out 'participatory appropriation' as one of her three planes of analysis for observing learning and development within a community, Rogoff too leans towards a process of construction as opposed to a more passive type of participation:

'... appropriation is a process of transformation, not a precondition for transformation. Thus, I use the term 'appropriation' to refer to the change resulting from a person's *own participation* in an activity, not to his or her internalisation of some external event or technique.'

(Rogoff, 2008, p. 67)

This links to Billett's view that, as a result of the seminal nature of its focus on 'the contributions of social practices and situational factors to individuals' cognition and learning', in most of the theory that grew out of Lave & Wenger's (1991) monograph:

‘... the particular attributes that individuals bring to cognitive processes (i.e. the person and the personal) have become de-emphasized and, in some cases, overlooked.’

(Billett, 2007, p. 55)

Billet goes further to argue that the concept of communities of practice set out by Lave & Wenger has been frequently misrepresented as depicting the participation of individuals in social practice as largely benign, and states his view that in their original work:

‘... are arguments and presentations that are highly consistent with a theoretical position that engages the personal within a social frame.’

(Billet, 2007, p.60)

In Section 2.3, the influence of what teaching assistants bring with them to their workplace learning is explored in relation to Fullers & Unwin’s (2004) ‘learning territories’ metaphor. These sets of experience are unique for each individual, which is relevant in considering Billett’s argument that relations between a community of practice and its members are relational, and that ‘rather than the individual being posterior to the social practice in which they engage, the relationship is agentic on both sides’ (2007, p. 56).

Murphy has identified agency, viewing the learner as ‘agent, the active constructor of meaning and knowledge’ (1996, p. 12), as a notion common to all sociocultural theories of learning. A consideration of the nature and extent of the agency of the teaching assistants in this study in relation to their work-based learning therefore seems important, since with limited or no agency it is unlikely that their OU study will generate much in the way of this form of learning. For example, as Graves wrote about the teaching assistants in her study, the ambiguity of their role on the one hand ‘does

limit choice and agency for individuals' but at the same time has the potential to allow them to 'become architects of their own identity' (2013, p. 101). Drawing on his earlier study (Billett & Pavlova, 2005), Billett (2007) describes how for the five workers interviewed for the research:

‘...there was a degree of dependence to achieve their goals. Yet that dependence was also relational and shaped by these individuals’ desire to be themselves.

They were able to negotiate and achieve their goals through their work.’

(Billet, 2007, p. 64)

Although the ‘diverse and circuitous pathways in arriving at their current work’ (Billett & Pavlova, 2005, p. 202) for the teaching assistants in my evaluation seem likely to be less extreme given the range of occupations explored by Billett and Pavolva, there may be similarities between the two groups in respect of the variety of life and employment histories represented. Consequently it seems plausible that a similar interdependent relationship might exist between what their individual situations in school afford them in respect of their learning, and their ability to exercise personal agency. Therefore an important element of this evaluation is to explore how teaching assistants’ study of the block might support or stand in the way of their ability to exert individual agency within their own settings.

## 2.3 Work based learning

In her study of students in their first year of a part-time degree programme for teaching assistants, Edmond concluded that:

‘Programmes of learning which construe workplace experience as a contributing source of knowledge and skill (as opposed to a context in which skill and knowledge can be demonstrated) need to take account of ... individual and

socio-cultural dimensions of learning from experience.’

(Edmond, 2003, p. 16)

The block requires students to draw on their workplace experience as a ‘contributing source’ to their learning but also, crucially, encourages them to use the same context to try out newly acquired knowledge, understanding and skills. It is important to draw a distinction between *demonstration* (i.e. showing the ability to do something) as used by Edmond, and opportunities to *try out*, one of the elements identified by Woodgate-Jones (2012) as instrumental in enabling student teachers to contribute to the professional development of qualified teachers by introducing new ideas into a setting.

Edmond also stresses the need to consider how students’ dual roles of worker and learner might lead to ‘power differences and teacher constraints influencing the learning of teaching assistants’ (2003, p. 15). For teaching assistants studying the block, this interplay may involve further complexities arising from differing levels of confidence in and pedagogical understanding of mathematics of the teachers with whom they work.

Edmond challenges Lave & Wenger’s (1991) contention that formal teaching provided by universities within work-based learning programmes is often out of date and of limited relevance to current practice. The students in Edmond’s study considered that their foundation degree had provided them with ‘up-to-date ... and importantly, professionally relevant knowledge which would not have been accessed through work but had value in the workplace in terms of informing practice’ (2010, p. 317). This supports Woodgate-Jones’ model of the ‘skilled newcomer’, discussed in Section 2.2. The kind of tensions this may lead to are captured by Edmond’s interpretation that the extent to which such knowledge leads to practice-related outcomes is dependent on how it is valued within a setting. For example, a finding from Postlethwaite & Haggarty’s research exploring what secondary mathematics and science student teachers reported



they had learned in university and in school by the end of their initial teacher education programme, was that:

‘ ... although aspects of university learning that matched school expectations were valued there was no discussion of how ideas that contest these practices were examined critically in the school context or were used as stimuli for innovative practice on the part of the student teacher or any colleague.’

(Postlethwaite & Haggarty, 2012, pp. 277-8).

The apparent reluctance to engage with student teachers as ‘skilled newcomers’ may be seen as a missed opportunity, both for furthering students’ professional development and refreshing and enhancing practice within schools. It is therefore interesting to speculate how far this may be the result of the students attempting to apply their university learning in a their placement schools almost as cold callers, and how the experience of teaching assistants studying E207 might differ given that, before embarking on the work-based elements of their study, they will have already established a presence and a role for themselves in their settings, in some cases to a significant extent.

There is a need, however, to look beyond the workplace when considering teaching assistants’ learning during the block. Fuller & Unwin critique Lave & Wenger’s account of learning as ‘not highlight[ing] the relevance of other forms of participation, such as boundary crossing between multiple communities of practice and off the job learning and qualifications’ (2004, p. 134), and in response developed the metaphor of ‘learning territory’, meaning:

‘ that every individual has, and has had, access to a (unique) range of learning opportunities that make up their learning territory. The territory is divided into regions ... We argue that the character and scope of the individual’s learning

territory (as well as how they respond to it) influences how he or she perceives and engages with opportunities and barriers at work.'

(Fuller & Unwin, 2004, p. 133)

Fuller & Unwin identify three 'regions':

- Classroom-based learning and qualifications
- Learning at home
- The workplace

All three appear relevant to the teaching assistants in this study. For many, it is possible that the home may be more influential for teaching assistants than some other occupational groups due to their situated interest and involvement arising and gained from being a parent. Many E207 students have children at primary school, and this may provide them with additional opportunities to try out and refine ideas from the block within their families and wider communities.

However, the main focus of Fuller & Unwin's work is ongoing 'on the job' learning, whereas my research specifically concerns a short experience of training and how it plays out in the school-based practice and wider lives of the participants. As such the block might be thought of as a teaching 'event' or perhaps more accurately a series of lessons, and in this respect, Hamilton usefully considers that:

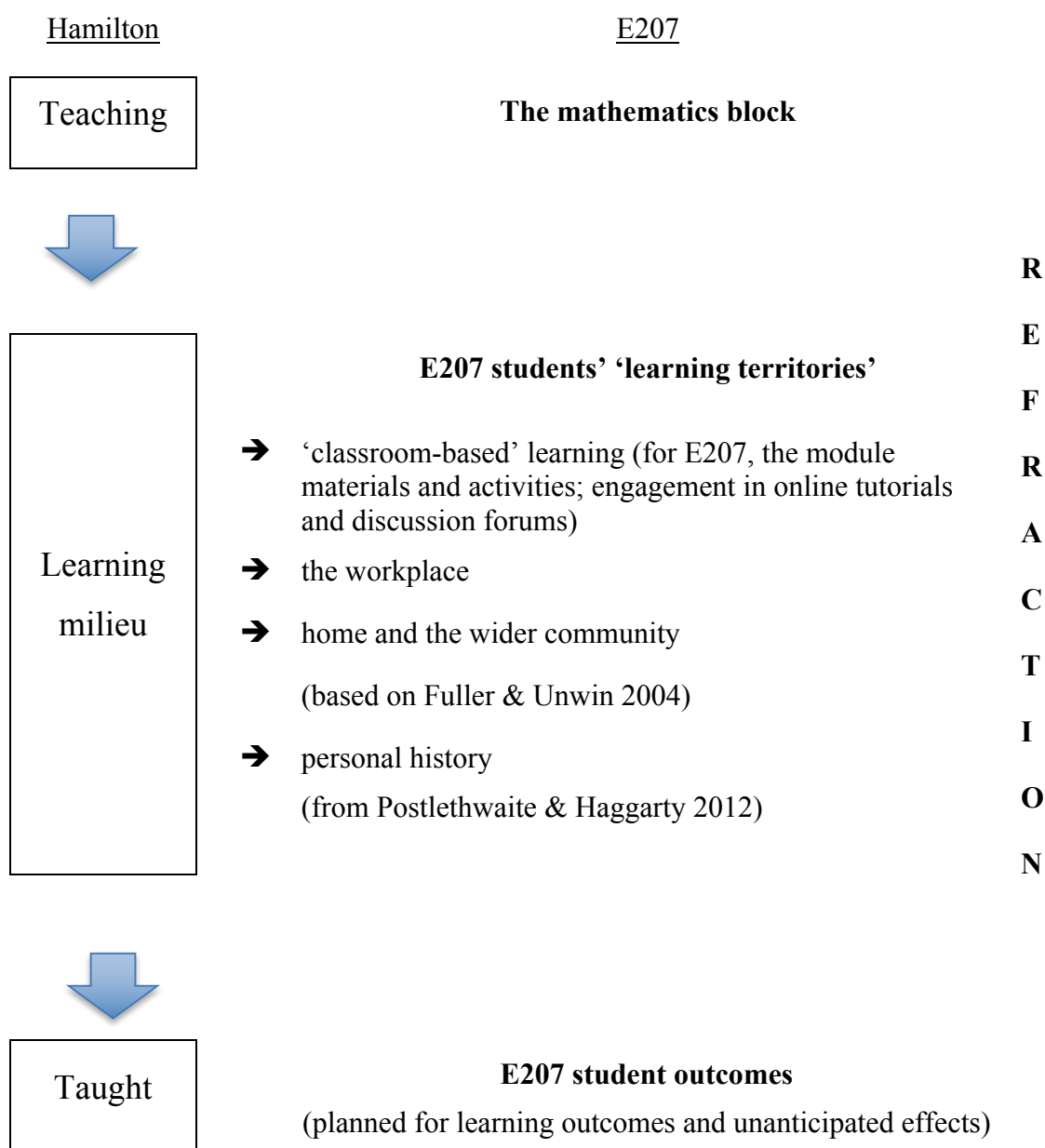
' .. within the classroom context, the relationship between teacher and taught is best understood as a refracting rather than a transmitting medium. (Thus, for example, different individuals learn different things from the same event) ... The learning milieu is not a pre-ordained setting, but, instead, is socially constructed.'

(Hamilton 1973, cited in Stenhouse, 1975, p. 154)

This view of teaching and learning may be particularly relevant for E207 students due to the opportunities that the module offers them to learn with and from others, irrespective of what they experience in their individual workplaces. In this way, their university study may help to mitigate some of the constraints that they might encounter in the workplace, by providing them with their own ‘communities’ for developing their understanding of the relationship between theory and practice.

Hamilton uses the concept of refraction in relation to teaching and learning within a physical classroom. The following diagram proposes a model for this process in relation to students’ learning on the block:

**Figure 2.1 Teaching as refraction on the E207 mathematics block**



In this model, individual elements of the block materials and infrastructure (i.e. online activities, reader, tutorials, forums etc.) represent potential 'teaching' and learning events. Each element is potentially the 'same event' for all students although, of course, individuals will engage with the different elements of the block in different ways and to different extents, as is also true of classroom teaching. 'Refraction' occurs as 'the character and scope of the individual's learning territory (as well as how they respond to

it)' (Fuller & Unwin, 2004, p. 133) influences how he or she perceives and engages with the block (the 'teaching'). Figure 2.1 also highlights the need for evaluations of teaching to attempt to capture unanticipated outcomes, as well as outcomes planned for by the teacher (or module writers in the case of E207). Both are necessary to help build a full picture of students' learning experience, as well as any refraction that has taken place, and therefore informed my decision to adopt a research strategy for this study based on illuminative evaluation (see Chapter 3) that 'aims to discover and document what it is like to be participating' (Parlett & Hamilton, 1972, p. 11). Lave & Wenger extend the view on what and how students might be learning in drawing 'a fundamental distinction between learning and intentional instruction' (1991, p. 40) as part of stressing that legitimate peripheral participation is a way of understanding learning and not a pedagogical strategy or teaching technique itself. This view does not rule out that teaching will result in learning, but does not necessarily:

‘... take intentional instruction to be in itself the source or cause of learning, and thus does not blunt the claim that what gets learned is problematic with respect to what is taught.’

(Lave & Wenger, 1991, p. 41)

Similar to Hamilton's 'refraction', Postlethwaite & Haggarty developed the notion of 'progressive filtering', identifying 'two significant filters to students' learning – their history and their school experience' (2012, p. 278) in their study of secondary science and mathematics students on an initial teacher education course. The authors proposed that ideas presented through teaching need to pass through these filters in order to feature meaningfully in student teachers' subsequent practice. The tensions that might arise between what is taught on the block and how this is viewed in individual schools has been discussed earlier in this section. In respect of 'history', for some of the

teaching assistants studying the block, it seems possible that this ‘filter’ may be a particularly significant contributor to the process of refraction given the issues concerning anxiety, lack of confidence and poor pedagogical understanding in relation to mathematics that were discussed in Section 1.5.

## 2.4 Evaluations of short experiences of training

As stated previously, the focus of my evaluation is teaching assistants’ experiences on a short block of learning on mathematical subject knowledge. From the literature covering evaluations of short training courses, I have identified 12 studies from a range of disciplines and subject areas that are particularly relevant to my research. Of these, three (Harland & Kinder, 1997; Solomon & Tresman, 1999; Joubert & Sutherland, 2008) are primarily literature reviews, although the first two also reconsider evaluations of CPD carried out previously by the respective authors. Some aspects of Joubert & Sutherland’s review were discussed earlier in section 1.6. Eight of the remaining nine studies (Kinder *et al.*, 1991; Harland & Kinder, 1992; Benson & Johnsey, 1998; Marrero *et al.*, 2010; Scott *et al.*, 2010; Carpenter *et al.*, 2011; Griffiths *et al.*, 2011; Trent, 2011) evaluate specific short programmes of CPD, and one (NCETM, 2009) includes a review of 30 CPD initiatives relating to mathematics within England during 2007-8, including some courses comparable in length to the block.

Joubert & Sutherland’s review draws on Eraut’s (2007) typology of learning in the workplace (see Table 2.2 below) to suggest that, for teachers, learning through a short course or study towards a qualification is likely to constitute only a relatively small proportion of their total learning.

**Table 2.2 Eraut's typology of early career learning**

<b>Work Processes</b> with learning as a by-product	<b>Learning Activities</b> located within work or learning processes	<b>Learning Processes</b> at or near the workplace
Participation in group processes	Asking questions	Being supervised
Working alongside others	Getting information	Being coached
Consultation	Locating resource people	Being mentored
Tracking challenging tasks and roles	Listening and observing	Shadowing
	Reflecting	Visiting other sites
Problem solving	Learning from mistakes	Conferences
Trying things out	Giving and receiving feedback	Short courses
Consolidating, extending and refining skills	Use of mediating artifacts	Working for a qualification
Working with clients		Independent study

(Redrawn from Eraut, 2007, p. 409)

Eraut's typology is not specifically related to education. His research draws also on nursing, engineering and accountancy, and it seems unlikely that the full range of learning experiences he sets out would be available to teaching assistants. Nevertheless, this typology is helpful in placing E207 students' short experience of mathematics learning within the wider context of work-related learning.

In developing my study, I have found it constructive to consider the approaches used in other evaluations of specific short programmes of CPD, in particular Harland & Kinder's (1997) ordering of INSET outcomes, which builds in two ways on the typology they developed in their 1992 research (referred to above) into CPD related to science in primary schools. First they relate the typology to other literature, and second, they put forward a 'tentative hierarchy' of these outcomes, stating 'it was apparent that the presence of certain outcomes was more likely to achieve developments in practice than others' (p. 76), giving rise to the following model:

**Figure 2.2 Harland & Kinder's ordering of INSET outcomes**

INSET input			
3rd Order	Provisionary	Information	New awareness
2nd Order	Motivation	Affective	Institutional
1st Order	Value congruence		Knowledge and skills
Impact on practice			

(Redrawn from Harland & Kinder, 1997)

I adopted this model as a starting point for my analysis of some of the data in this study, on the basis that it captures some of the complexity and interrelatedness of the factors in play:

‘(e.g. *provisionary* outcomes in themselves could be highly *motivating*, or a teacher who has been enthused by the INSET experience – *motivational outcome* - might seek out further courses to increase her or his *knowledge and skills*). However, it was the presence of the two first order INSET outcomes which consistently coincided with a substantial impact on practice, although these in turn might well require the presence of other lower order outcomes – such as *provisionary* or *institutional* to ensure sustained implementation.’

(Harland & Kinder, 1997, p. 77)

However, it is important to note that the hierarchy was based on the authors’ own experiences of teaching and professional development, and it seems reasonable to speculate that individual teachers might have populated and ordered it differently. I anticipated that for teaching assistants, differences both in the individual components, and their relative positions within such a hierarchy, may be potentially greater still due



to the nature of the roles of individual teaching assistants and the kind of factors discussed earlier in this chapter.

## 2.5 E207 as a distance learning module

Lentell defines distance learning as ‘the totality of arrangements made by a university for a student cohort that is separated geographically from its learners and services’ (2012, p. 25). Although this definition relates to distance learning provided by ‘conventional campus-based universities’ (p. 24), it is nevertheless applicable to E207, with the ‘totality of arrangements’ being the module materials, infrastructure and support as set out earlier in Section 1.3. The OU differs from the universities in Lentell’s study in that it has provided only distance learning approaches, supplemented with some face-to-face tutorials, since its first cohorts of students commenced their studies in 1971. It has been a provider of courses for teaching assistants since its first course under the UK Governments’ Specialist Teacher Assistant programme in 1995 (Swann & Loxley, 1998).

Lentell refers to the ‘extensive body of literature on the holistic, systematic nature of distance learning’ (2012, p. 25). However, whilst effective policies, structures and systems at institutional level are important elements to consider when evaluating distance learning provision, I have not included a review of this wider literature because my evaluation is located at the micro level, focusing on the experiences of one cohort of teaching assistants on a specific block of learning. Instead my discussion, drawing on Anderson & Dron’s simple typology of distance education pedagogies (see Table 2.3 below), is on the ‘the pedagogy that defines the learning experiences encapsulated in the learning design’ (Anderson & Dron, 2011, p. 80).

**Table 2.3 Typology of distance education pedagogies**

<b>Generation of distance education pedagogy</b>	<b>Tech-nology</b>	<b>Learn-ing active-ities</b>	<b>Learner gran-ularity</b>	<b>Content gran-ularity</b>	<b>Evaluation</b>	<b>Teacher role</b>
Cognitive-behaviourism	Mass media: Print, TV, radio, one-to-one communication	Read and Watch	Individual	Fine: scripted and designed from the ground up	Recall	Content creator, sage on the stage
Constructivism	Conferenc-ing (audio, video, and web), many-to-many communication	Discuss, create, construct	Group	Medium: scaffolded and arranged, teacher-guided	Synthesize: essays	Discussion leader, guide on the side
Connectivism	Social networks, aggregation & recommender systems	Explore, connect, create, and evaluate	Network	Coarse: mainly at object and person level, self-created	Artifact creation	Critical friend, co-traveler

(Adapted from Anderson & Dron, 2012)

Building on previous distance education theory that focused on the technologies used for delivery at the time, Anderson and Dron identify three distinct generations of technologies and map onto each a corresponding ‘generation’ of distance education pedagogy. In considering where the block might sit in relation to this typology, two points made by the authors are of particular importance. First, although Anderson & Dron’s model presents the three pedagogies chronologically in the order in which they arose, none has disappeared following the emergence of subsequent generations, and second, each model has its own strengths and weakness and that ‘all three current and future [models] have an important place in a well-rounded educational experience’ (p.

92). For Table 2.4 below, I have extracted and summarised what Anderson & Dron consider to be the key characteristics of cognitive, social and teaching ‘presence’ in each of their models of distance education pedagogy, where ‘cognitive presence’ is ‘the means and context through which learners construct and confirm new knowledge’ (p. 83).

**Table 2.4 Cognitive, social and teaching presence in models of distance education pedagogy**

<b>Model of distance education pedagogy</b>	<b>Cognitive presence</b>	<b>Social presence</b>	<b>Teaching presence</b>
Cognitive-behaviourism	Instructional design based on learning objectives that are stated and exist apart from the learner and context of study.	Very little social presence; learning seen as an individual process.	Occasional interaction between teacher and student; teaching largely delivered by print, television and audio.
Constructivism	Learning often takes place in the workplace and other real-world contexts outside of formal classrooms; learners are actively engaged.	Peer interaction seen as a critical component.	Content seen as secondary to the learning process; teaching focuses on guiding and evaluating authentic tasks performed in realistic contexts.
Connectivism	Learners develop skills and solve problems in ‘powerful’ networks; learning is based as much upon production as consumption of educational content.	Social presence extends beyond institutional time frames (e.g. wikis, Twitter and other network tools).	Teaching involves creating learning paths, and designing and supporting interactions; learners and teachers collaborate to create content and re-create it for future use by others.

(Summarised from Anderson & Dron, 2012)

These three ‘generations’ (Table 2.3) and their accompanying dimensions of ‘presence’ (Table 2.4) offer a potentially helpful way of thinking about what the teaching assistants in my evaluation have to say about their experience of the block. I suggest that the ‘constructivism’ model articulated by Anderson & Dron appears to be the best fit model

for the block, on account of its substantial work-based element, opportunities for students to interact with peers in online forums and tutorials, and its affordance for students to pursue their own priorities and interests as they progress through the block, with guidance and support available from their tutor. Indeed, in respect of the work-based element, Baxter's small scale research into retention and progression of OU students identified that 'putting their knowledge into practice or [the] capacity to take on greater responsibilities acted as a powerful motivator' (2011, p. 118) to succeed in their studies.

However, in terms of 'cognitive' presence the block might also be seen, in part at least, as being influenced by a cognitive-behaviourist pedagogy. This is particularly the case vis-à-vis the block's learning outcomes, which were determined entirely by the module writers and against which students are assessed. As one of these writers, I can confirm that these learning outcomes took careful account of what was known about the potential range of contexts, histories and aspirations of the teaching assistants who would study the module. However, it must be acknowledged that learning outcomes determined in this way inevitably cannot get close to reflecting the 'full richness and complexity of human beings learning to be, as opposed to learning to do' (Anderson & Dron, 2012, p. 84).

A further complication in attempting to map the block onto Anderson & Dron's models is that, although it is set up to enable students to engage with and hopefully benefit from a strong social and teaching presence, there may be some teaching assistants (possibly a significant number) who away from the school context choose to approach their learning from the block as a mainly individual process. This may be through choice, for example because they feel that they prefer to learn this way, or because they feel anxious about interacting with others in a learning context and particularly online. Alternatively it may be due to technical difficulties with accessing the necessary online

provision. Given the earlier discussion about the learning outcomes, this potential group of students' predominant pedagogical experience of the block might align most closely with Anderson & Dron's cognitive-behaviourism.

Although the teaching assistants contributing to my evaluation will have experienced some online study during the modules that precede E207 within their foundation degree, it is important to acknowledge the findings of Safford & Stinton's study into digital distance learning, which found that for 'non-traditional' students in particular:

'Barriers to study include where and when to go online, finding support for digital study, navigating virtual learning environments and knowing what is relevant, variable or no technologies in the workplace, making connections between workplace technologies and ICT for study, and storing and organising digital information.'

(Safford & Stinton, 2016, p. 135)

Safford & Stinton's study explored the experiences of students on earlier modules in the OU's Foundation Degree for teaching assistants, as well as students studying on early years qualifications. It seems possible, therefore, that some of these barriers might remain relevant for students studying the block.

## 2.6 Summary

The literature reviewed in this chapter falls broadly into two main areas. First, forming the substantive part of the chapter, I have discussed sociocultural views of learning because, as I have endeavoured to draw out, I consider the role of the social context to be a centrally influential factor in how the learning of individual teaching assistants studying the block occurs and how, for them, meaning is created. Within the studies and theories discussed, I identified Lave and Wenger's (1991) work on legitimate peripheral

participation, and its subsequent development by Wenger (1999) as most relevant for analysing the data. This is because it seemed likely that the trajectories and the nature of participation of the teaching assistants studying the block might, in some ways, be similar to some of the models of apprenticeship considered by Lave and Wenger, but that there might also be key differences. As such I anticipated that this area of theory, in particular, would offer a helpful and rich means for attempting to explain the data.

Second, the remainder of the chapter continued to consider sociocultural perspectives, but within the specific areas of work-based learning, and short programmes of CPD in particular. In line with this study's stated positioning as an evaluation, I selected from the literature Harland & Kinder's (1997) hierarchy of INSET outcomes as a starting point for analysing the data, as it provided a tight focus on the teaching event itself (i.e. the block). Additionally, in a similar way to Lave and Wenger's work, it offered a theory based on a particular group of learners (in this case, teachers), the relevance of which could be considered against the experiences of a related but distinct group of practitioners (teaching assistants), thereby potentially offering fruitful exploration of any similarities and differences between the two groups.

Although, as stated above, I adopted two areas of theory and research in particular to help explain the data, many of the other studies considered in this chapter are also woven into my analysis in the following chapters. The discussion of agency in Section 2.2.3, in particular, emerged as centrally relevant.



## Chapter 3 Methodology and methods

### 3.1 Introduction

In this chapter I set out and justify the decisions taken in developing the methodology for this study, and the methods that were used. In Section 3.2, I discuss the ethical considerations that arose. In Section 3.3, I draw on Burgess *et al.*'s (2006) definition of methodologies as 'the theoretical frameworks and concepts in which approaches and methods are situated' (p. 53), to explain the interpretive and constructivist stance underpinning my collection and analysis of data. In Section 3.4, I apply Bryman's (2006) concept of a *research strategy* as the 'general orientation to the conduct of social research' (p. 35) to justify the adoption of a qualitative approach to data collection, supported by some quantitative data. I then argue for the adoption of a research design based on an *illuminative evaluation* framework (Parlett & Hamilton, 1972) within this general orientation. Finally, in Section 3.5, I explain my use of a questionnaire, progressively focused semi-structured interviews and documentary sources as data collection methods.

### 3.2 Ethical considerations

The OU's Human Research Ethics Committee approved my research outline and proposed methodology. As the study involved current OU students, additional approval was required and granted by the University's Student Research Project Panel (SRPP). For my evaluation, this process resulted in a restriction of the sample size. For the questionnaire (see Section 3.5.1 below), eighty-eight out of the cohort of 302 students (29.14%) were deemed ineligible to take part. Thirty-seven of the eighty-eight were ineligible due to their recent or impending involvement in other research, and a further fifty-one because they had opted previously not to be contacted for marketing or market



research purposes. Ethically, the need to protect the interests and well-being of students is paramount, particularly in relation to their workload. In this instance the reduction in the number of students invited to take part was not significantly detrimental to the representativeness of the sample. Nevertheless it may have excluded individual students with potentially rich data to contribute, but this is likely to be the case for any research of this nature.

In positioning my research as an evaluation, I was fulfilling the role both of a lecturer on the module being evaluated and of researcher. As such, my evaluation might therefore be seen in some respects to constitute ‘insider’ research (Merton, 1972).

Hellawell (2006) sets out some of the pros and cons to such a position. One advantage, for example, is that an insider researcher will be familiar with the context and may have already developed a rapport and positive relationship with the research participants.

Against this, for my evaluation, is the possibility that participants may have felt inhibited in their responses as a result of power relationships arising from my position as lecturer on a module in which they were being assessed. Trent (2011) identified this as a concern in his study exploring the experiences of eight Hong Kong teachers on a short-term professional development course on which he was their teacher. This issue is discussed further later in this chapter.

From the outset of my EdD studies, I have endeavoured to adhere to the BERA (2011) guidelines for educational research, which include obtaining voluntary informed consent from all participants based on them being made fully aware of what their participation will require of them. As described later in this chapter, I sought to follow this requirement at all stages of the data collection process. Floyd and Arthur however, writing about insider research, describe issues such as informed consent and anonymity as ‘external ethical engagement’ which, although necessary and important, are

characterised as being easily identifiable and superficial, and contrast this level of engagement with ‘internal ethical engagement’ which relates to:

‘... the deeper level ethical and moral dilemmas that insider researchers have to deal with once ‘in the field’ linked to ongoing personal and professional relationships with participants, insider knowledge, conflicting professional and research roles, and anonymity.’

(Floyd & Arthur, 2012, p. 171)

This is a powerful point, implying that these matters, all relevant to my evaluation, need to be at the forefront of a researcher’s thinking at all times while carrying out insider research. However my role as an inside researcher is a nuanced one. In this respect, Mercer reconceptualises the insider/outsider relationship as a continuum rather than a dichotomy:

‘The researcher’s relationship with the researched is not static, but fluctuates constantly, shifting back and forth along a continuum of possibilities, from one moment to the next, from one location to the next, from one interaction to the next, and even from one discussion topic to the next.’

(Mercer, 2007, p. 13)

I found the concept of a ‘shifting insider role’ comforting as I grappled, in particular, with the kind of relationship and tone of engagement to establish with the interviewees. As I discuss later in Section 3.5.2, there were times when I feel I could have handled these interactions more effectively. However, I have tried to develop reflexivity by continually reviewing my data collection as I progressed through the interview process, and I present a transparent account of the key aspects of this at relevant points later in this chapter.

### 3.3 Research Methodology

Bryman emphasises how ‘social research does not exist in a bubble, hermetically sealed off from the social sciences and the various intellectual allegiances that their practitioners hold’ (2012, p. 19.). Newby comments on the complex and multi-dimensional nature of these processes, emphasising in particular how different philosophies comprise ‘approaches and beliefs that are not mutually exclusive’ (2010, p. 33). Nevertheless, as Newby stresses, it is necessary for researchers to articulate the underlying assumptions informing their research in order for the research methods and conclusions to be critiqued.

Texts on social and educational research methodology (e.g. Silverman, 2005; Newby, 2010; Cohen *et al.*, 2011; Bryman, 2012) draw attention, not only to the existence of a considerable and growing range of research paradigms, but also to a lack of uniformity in how they are conveyed in the literature. In articulating my own standpoint, I found Bryman’s (2012) discussion of epistemological and ontological considerations particularly helpful for developing my understanding of the nature of the relationship between theory and research. Bryman defines epistemology as concerning ‘the question of what is (or should be) regarded as acceptable knowledge in a discipline’ (2012, p. 27). Cohen *et al.* relate this more specifically to the research process, stating that epistemology is about ‘how we understand and research the world’ (2011, p. 23). Similarly to Bryman, Cohen *et al.* set out how epistemological viewpoints fall under two broad paradigms: positivist and interpretivist. A positivist view considers knowledge to be ‘hard, objective and tangible’ and therefore calls for researchers to adopt ‘an observer role, together with an allegiance to the methods of natural science’ (Cohen *et al.*, 2011, p. 6). Such a view of knowledge is at odds with that portrayed in Harland & Kinder’s (1992) and Joubert & Sutherland’s (2008) research into CPD (first

discussed in Chapter 2). These studies suggest that information about practitioners' knowledge, values and beliefs is needed in order to develop an understanding of the outcomes of CPD. Unlike that tested in a laboratory experiment, this kind of knowledge is not 'hard, objective and tangible'. Rather it is 'personal, subjective and unique ... [and] imposes on researchers an involvement with their subjects and a rejection of the ways of the natural scientist' (Cohen *et al.*, 2011, p. 6). To adopt this contrasting view of knowledge represents an interpretivist stance. Cohen *et al.* suggest that interpretative research 'begins with individuals and sets out to understand their interpretations of the world around them' and that in this process 'theory should not precede research but follow it' (2011, p. 18). My intention in this evaluation was to gather (and be led in my thinking by) the data to provide insights into the experiences of the teaching assistants' studying the block. However, I acknowledge that I also drew on some of the influential theoretical ideas (Lave & Wenger's foremost among them) discussed in Chapter 2 to help stimulate my thinking in relation to the data. As such, my intention was not to use this theory in a 'normative' sense:

'Normative researchers try to devise general theories of human behaviour and to validate them through the use of increasingly complex research methodologies'

(Cohen *et al.*, 2011, p. 18)

Rather, by beginning my study by considering the ideas of Lave & Wenger and others, my intention was to set out the overarching sociocultural theories that I considered to be potentially the most helpful for thinking about the data.

Whilst epistemology concerns the nature of knowledge about the world, ontological considerations relate to the nature of the world itself. In the context of social research, ontology relates specifically to social entities, for example organisation and culture. In particular, ontology is concerned with:

‘... whether social entities can and should be considered objective entities that have a reality external to social actors, or whether they can and should be considered social constructions built up from the perceptions and actions of social actors.’

(Bryman, 2012, p. 32)

Bryman uses the terms ‘objectivism’ and ‘constructionism’ (or ‘constructivism’) respectively to categorise these contrasting views of the world. An objectivist position contends that organisation and culture, for example, are pre-constituted and not able to be fashioned by the people coming into contact with them. Against this a constructivist argument, if taken to its extreme, would have it that social entities are entirely social constructions. However I believe a more realistic approach, based on the sociocultural perspectives that have informed this evaluation, is to acknowledge the pre-existence and influence of social entities but that nevertheless ‘social reality is an ongoing accomplishment of social actors rather than something external to them and that totally constrains them’ (Bryman, 2012, p. 34). The teaching assistants in my study, for example, may be constrained and influenced by the social world of their school contexts to varying extents. However, they are also a part of those social worlds, whose meaning will to some extent be constructed through its interaction with them, and in which they may be able to exercise varying degrees of personal agency.

To summarise the discussion in this section thus far, I have positioned my research as adopting an interpretivist and constructivist standpoint. Bryman (2012) suggests that such a stance is likely to predominantly involve the collection and analysis of qualitative data. However, it is important to acknowledge, as Bryman does, that in reality the distinctions between quantitative and qualitative approaches are not clear-cut. For example, as discussed earlier in this chapter, as well as being about generating

theory, qualitative research may sometimes involve the testing out or refinement of influential existing ideas such as Lave & Wenger's legitimate peripheral participation against the reality of locally collected data. Reflecting this more blurred line between quantitative and qualitative strategies, my evaluation does draw on quantitative data as set out in subsection 3.5 below, both to provide an overview of the cohort's experience of studying the block, and help to begin the identification within the data of the themes that were subsequently developed more fully in the final phase of the evaluation. However, the most prominent data collection methods used were qualitative, reflecting an approach that 'emphasises words rather than quantification in the collection and analysis of data' (Bryman, 2012, p. 36), an emphasis that is indicative of the underlying theoretical perspectives that have informed this study.

### 3.4 Research Design

In this section I set out more specifically my chosen design for the collection and analysis of data.

In Section 1.2, I positioned this study as an evaluation. Newby defines an evaluation strategy as one that simultaneously seeks to answer two types of question. First, 'impact evaluation' attempts to 'find out and understand outcomes' (2010, p. 619). Second, 'process evaluation' reflects the need to 'go beyond a demonstration that something has been achieved and explore the processes involved' (p. 620). Both are relevant to my research questions' focus on the outcomes, and in particular the processes, of students' study of the block.

In their discussion of the similarities and differences between evaluation and research, Cohen *et al.* write about the 'politics of educational research' and how 'evaluation' is usually seen as being more applied and political than 'research', often having been

commissioned by policy makers to evaluate specific policies and projects. They set out how, under this view of evaluation:

‘Research ceases to become open-ended, pure research, and, instead, becomes the evaluation of *given* initiatives. Less politically charged, much research is evaluative, and indeed there are many similarities between research and evaluation.’

(Cohen *et al.*, 2010, p. 48).

I have positioned this study as an evaluation, and whilst there is a sense in which it is an evaluation of a ‘given initiative’ (i.e. the block), I contend that its scope and interpretivist underpinning take it more into the realms of ‘evaluative research’, and less into the category of a more narrowly focused evaluation driven by vested interests, as outlined by Cohen *et al.*

In particular, as stated earlier, I am aligning my approach to the practice of ‘illuminative evaluation’ that was pioneered in the 1970s by Parlett & Hamilton (Parlett & Hamilton, 1972 & 1987), who considered it more appropriate for evaluating educational programmes than the experimental or psychometric methods that had been dominant until then. Their critique of the latter is summarised succinctly by their observation that ‘rarely can “tidy” results be generalized to an “untidy” reality’ (Parlett & Hamilton, 1972, p. 7). In Chapter 2, I discussed Joubert & Sutherland’s (2008) finding that evaluations of CPD in mathematics have tended to lack a systematic and rigorous approach. The authors attributed this in part to the difficulty of finding suitable methods to throw light on complex situations, the outcomes of which are not easily measured. Parlett & Hamilton’s perspective, and the epistemological and ontological stance I set out in Section 3.3, suggest that measurement is not what evaluations of CPD (an in-service experience whereby new understandings need to be integrated meaningfully by

practitioners) should be primarily about. On the contrary, they are more suited to an illuminative evaluation framework, the prime concern of which should be ‘description and interpretation rather than measurement and prediction’:

‘[illuminative evaluation] aims to discover and document what it is like to be participating in the scheme ... and, in addition, to discern and discuss the innovation’s most significant features, recurring concomitants and critical processes.’

(Parlett & Hamilton, 1972, pp. 10-11)

Two concepts are central to illuminative evaluation. First, the ‘instructional system’ is ‘an idealized specification ... a set of elements arranged to a coherent plan’ of a scheme (for example, the block as set out and explained to students on the module website), and may consist of ‘a set of pedagogic assumptions, a ... syllabus, and details of techniques and equipment’ (Parlett & Hamilton, 1972, p. 12). Parlett & Hamilton criticised ‘traditional’ evaluations for ignoring that ‘an instructional system, when adopted, undergoes modifications that are rarely trivial ... [and] assumes a different form in every situation’ (pp. 12-13). This process can be considered as similar to Hamilton’s portrayal (cited in Stenhouse, 1975), discussed in Chapter 2, of the relationship between teaching and taught as a refraction.

The second concept central to illuminative evaluation is the ‘learning milieu’, also first discussed in Chapter 2. The learning milieu is where the instructional system, essentially an abstract entity, is enacted. It represents a network of:

‘... cultural, social, institutional, and psychological variables. These interact in complicated ways to produce, in each class or course, a unique pattern of circumstances, pressures, customs, opinions, and work styles which suffuse the teaching and learning that occur there.’



In exploring outcomes, an illuminative evaluation attempts to take account of these variables and the ways in which they interact. As I discuss in Section 3.4 below, illuminative evaluation is not restricted to the use of particular research tools. Rather it ‘aims to be both adaptable and eclectic’ (Parlett & Hamilton, 1972, p. 17) and can include both qualitative and quantitative methods, which I have done.

Van Rensburg (2008) describes how the original concept of illuminative evaluation has subsequently evolved into a number of other evaluation methodologies, but contends that Parlett and Hamilton’s approach remains appropriate for evaluating teaching and learning environments, especially for programmes of study in which learning takes place or is applied in many workplaces, each with its own unique characteristics. For this reason van Rensburg framed her study of a work-based distance learning module within a vocational qualification in animal health in South Africa as an illuminative evaluation. She considered that this approach came closest to meeting the requirement to ‘both provide the necessary information and also take into account the complexity of the context-dependent situations involved’ (van Rensburg, 2008, p. 225). An illuminative evaluation framework has also been used in a number of contemporary education-related studies, in particular within nursing education (e.g. Ellis, 2003; Clemow, 2007; Mason, 2010).

My evaluation shares a number of characteristics with van Rensburg’s, specifically:

- similarly to the vocational animal health programme in van Rensburg’s study, defining the specific goals of the E207 mathematics block is complex, because they differ between students depending on, for example, the targets set by individual students following the mathematics audit;

- both studies concern work-based learning, in which a significant proportion of the learning takes place at multiple sites across a wide geographical area, with each site having its own unique organisation and socio-cultural characteristics.

### 3.5 Research Methods

As discussed in the previous section, illuminative evaluation constitutes a general research strategy, in which the ‘choice of research tactics follows not from research doctrine but from decisions as to the best available techniques’ (Parlett & Hamilton, 1972, p. 17). Parlett & Hamilton stress the importance of not relying on one method in isolation, in order that the processes and outcomes of the research are considered from a number of angles and to facilitate triangulation of the findings. Nevertheless within a broad range of techniques, illuminative evaluations rely on observation and interviews as the primary data collection methods, complemented by questionnaires and documentary sources (Parlett & Dearden, 1977, pp. 18-21). This foregrounding of observation and interview data is seen as important by Light & Cox who comment that the use of the actual words of participants within educational research:

‘... has led to a deeper appreciation of the different ways in which students learn and value their different experiences. We are less inclined to talk about students in general and more aware that average ratings may conceal differences which are important in developing better courses and teaching methods.’

(Light & Cox, 2001, p. 198).

A key intention of my evaluation has been to develop a deeper understanding of students’ experiences on the block through enabling their voices to be heard in a way that stands to generate a richness of data for analysis. This desire is reflected in my

choice of progressively focused interviews, set out in Section 3.5.2 below, as the main data collection method for my evaluation. The constraints of working as a sole researcher on a professional doctorate programme led me to forego observation as a research method for this study, although I acknowledge that it would likely have provided additional valuable insight into the processes and outcomes of the block, and allowed for more rigorous triangulation of findings. Ellis (2003) similarly decided not to include observation in her illuminative evaluation of CPD within health care, referring in particular to the labour-intensiveness of observation required to capture the complexity of the context of individual workplaces. For my evaluation, two additional factors ruled out observation within the time and resources available: the likely wide geographical spread of interviewees, and the difficulty for interviewees to be certain of engaging in appropriate practice in school at a particular time.

Notwithstanding the absence of observation, I consider my research design to be sufficiently aligned overall to the characteristics of an illuminative evaluation to be described as such, for the following two reasons in particular. First, the data analysis took the form of ‘progressive focusing’, allowing ‘unique and unpredicted phenomena to be given due weight’ (Parlett & Hamilton 1972, p. 20). Parlett & Hamilton explain how this process comprises three stages, in which investigators ‘observe, inquire further and then seek to explain’ (p. 18), drawing on data from all of the sources used.

Data collection within my evaluation (i.e. the main study) consequently comprised three stages:

1. A questionnaire was issued to 214 students to provide a broad picture of their experience on the block, and the translation of their learning into their practice and wider experience (see Section 3.5.1)

2. Telephone interviews were undertaken with nine students, drawing on their questionnaire response, written assignments and online forum contributions as prompts to discussion (see Section 3.5.3)
3. Follow up telephone interviews with the same students were carried out to probe further on their responses in the first interviews, and to explore themes emerging from my initial consideration of the first interviews as a whole

The following table maps the three stages of data collection in my evaluation against Parlett and Hamilton's description of each of the three stages of illuminative evaluation, and shows that stages 2 and 3 in my process combine to correspond with Parlett and Hamilton's second stage, 'enquiring further'.

**Table 3.1 The three stages of illuminative evaluation**

<b>3 Stages of Illuminative Evaluation (from Parlett and Hamilton 1972)</b>	<b>Methods adopted in this evaluation</b>
<u>Stage 1</u> Observing or becoming 'knowledgeable about the scheme' (p. 19)	<u>Stage 1</u> Questionnaire to provide a broad picture of students' experience on the block and the translation of their learning into their practice and wider experience (see Section 3.5.1).
<u>Stage 2</u> Enquiring further	<u>Stages 2</u> Progressively focused telephone interviews with nine students (see Section 3.5.2).
<u>Stage 3</u> Seeking to explain	<u>Stage 3</u> Considering applicability of Harland & Kinder's (1997) hierarchy of INSET outcomes to questionnaire, interview and documentary data; identifying key themes within the data, drawing on sociocultural theory to discuss findings within a broader explanatory context.

A key feature of this process is that the three stages ‘overlap and functionally interrelate’ (Parlett & Hamilton, 1972, p. 20). For my study this was particularly the case for stages 2 and 3. As discussed in Section 3.5.2 below, the use of interviews aimed to facilitate increasingly more focused questioning as the data gathered to date was analysed. Stages 2 and 3 can therefore be seen as iterative and recursive.

Second, as set out in Sections 3.5.1 and 3.5.3 below, questionnaires and documentary sources were also used to inform the selection of and questioning of interviewees as well as to substantiate and triangulate the findings from the interviews that form the main data collection component of the evaluation.

### 3.5.1 Questionnaire

The questionnaire is included in Appendix B. Its purpose was to gather data from individual students to enable a broad picture of their experience of the block and the translation of their learning into their practice to emerge, along with evidence of any wider outcomes. It also facilitated the selection of nine students for interview.

Demographic and general background information about students was also gathered to contextualise and widen the scope for analysis. The self-completion questionnaire comprised closed questions with a choice of answers, as well as open questions, some of which invited the respondents to comment further on their responses to closed questions. Analysis of the data from an initial study carried out in accordance with the requirements of the EdD programme informed the questionnaire’s development (see also Section 4.2). In Murphy’s (2006) study, alongside a questionnaire, trainee teachers were asked to expand verbally on their responses. In a similar way, the open text questions were included in anticipation that they would generate richer data. The questionnaire used by NCETM (2009) provided a helpful starting point for developing the questions. The range of training programmes included in the NCETM research

extended far wider than the short intensive input of the block, and so only the questions that were identified as applicable to this study were considered. The NCETM research explicitly adopted a sociocultural perspective and therefore included an exploration of the context of the CPD being evaluated. This perspective was reflected in the questions included in its study. Of the NCETM questions considered, some have been included in my evaluation with the wording unchanged, some with the wording adjusted and others not included at all according to their applicability to the block. Questions relating to ‘reported’ confidence and ability in mathematics used by Henderson and Rodrigues (2008) in their research into Scottish student primary teachers’ preparation for teaching mathematics were also drawn on.

In order to gain insights into teaching assistants’ perceptions of changes in pupils’ learning, the following open question was included, the wording of which is identical to that used in the NCETM questionnaire:

If applicable, please describe any changes in pupils’ behaviours, attitudes, attainment and learning that you have observed which you consider to be a result of changes in your practice?

With the aim of eliciting insights into the contextual factors affecting teaching assistants as they endeavoured to translate their learning from the block into practice, two Likert scale questions specifically relating to teaching assistants’ interaction with the class teacher were included along with the following request:

Please identify and explain any factors that you feel have supported or inhibited your ability to transfer what you have learned during the E207 mathematics block into your classroom practice.

The invitation to take part in the research was written by me, and endorsed by the module chair, in order to meet the SRPP's requirements (see Appendix C). To help counter the possibility of the questionnaire being perceived by students as a regular market research exercise, the invitation presented participation in the research as a valuable opportunity for students to reflect further on their learning, and to contribute to the body of educational research.

### 3.5.2 Interviews

I planned to interview ten students to provide a degree of representation across the cohort in terms of student backgrounds and range of study outcomes, although I acknowledge that, given this number, the extent to which this range might be represented would be restricted. As Harland & Kinder concluded, 'the effects on and consequences of' the same offering of CPD for different participants can be 'disparate and individualistic' (1997, p. 81). Telephone interviews were used as a time and cost-effective method for gathering the data, given time constraints, and the work and family commitments and geographical spread of interviewees. Some researchers have identified disadvantages to telephone interviews, 'such as the lack of eye contact or body language or a possibility that responses are limited' (Murphy, 2006, p. 232). On the other hand, the reduction in social cues has the potential to enable some respondents to speak more freely, especially about sensitive issues, than they might feel able to do in a face-to-face interview (Opdenakker, 2006) .

Twenty-nine out of the sixty-seven students who completed the questionnaire indicated that they would be willing to talk to me on the telephone. With regard to voluntary informed consent, these twenty-nine students were sent a short email explaining briefly the nature, timing and duration of the telephone interviews and asked to confirm their willingness to take part. In response, fifteen students indicated their willingness to

participate. A consequence of the very positive response to the block overall, discussed later in Chapter 4, was that this group of fifteen students did not include any whose overall response to the block was negative. Although few in number, it would have been valuable to interview one or two such students. Another feature of the fifteen students was that they were all female. Whilst this is indicative of the largely female make up of the cohort overall, male representation amongst the interviewees may have added a further dimension to the evaluation's findings.

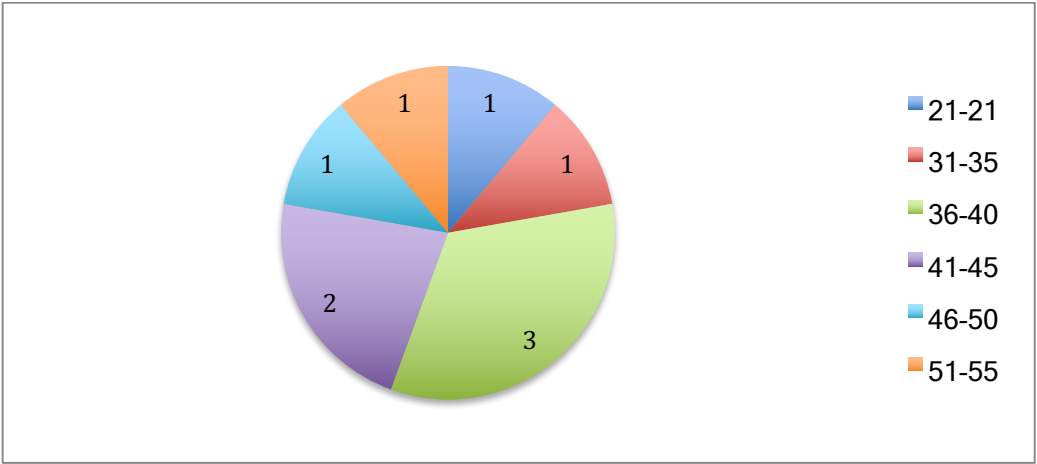
Acknowledging the above shortcomings, I invited eleven students, selected with the aim of assembling the widest possible range of ages, cultural backgrounds, qualification levels in mathematics, lengths of experience supporting children's learning and age phases worked in, as well as a balance between those who had stated that they were confident and positive about mathematics before starting the block, and those who had begun their study feeling less positive. However, six of the eleven invited students either failed to respond to the invitation or withdrew. Those who did not respond were sent one reminder email, but were not pursued further as I felt this may have constituted duress at a time when students can feel pressurised by the demands of their studies. No further responses were forthcoming, and therefore I invited the four students not originally selected so as to recruit as large a group of interviewees as possible.

The final number of interviewees was nine, constituting a self-selecting group. As Newby states, self-selecting respondents are 'usually the most interested and represent, therefore, only a subset of those who have views' (2010, p. 254). This was a potential drawback for my evaluation. Of particular concern was that only two of the final nine students indicated in their questionnaire responses that they were relatively less confident in and positive towards mathematics before starting the block. Nevertheless, within an illuminative evaluation's focus on 'what it is like to be participating in the scheme' rather than 'measurement and prediction' (Parlett & Hamilton 1972, pp. 10-

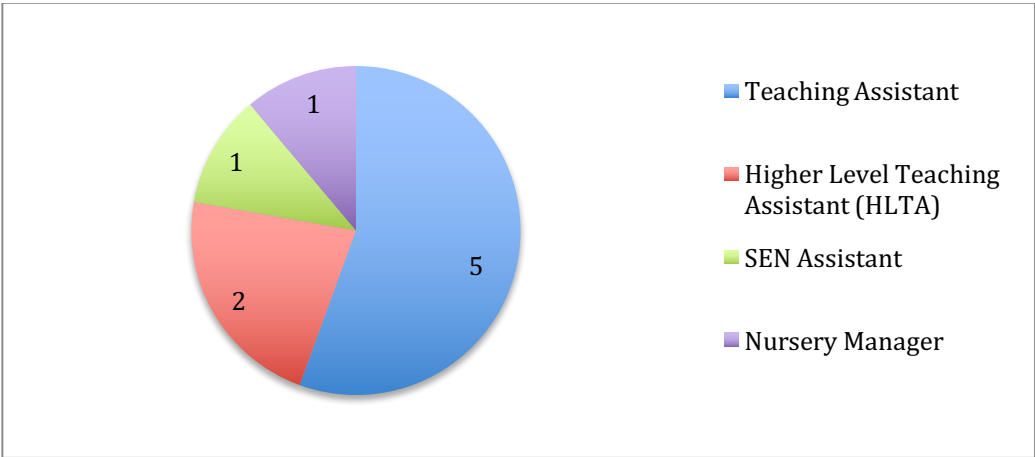


11), I hoped that the nine interviewees would represent a sufficiently wide range of experiences to enable individual cases to be evaluated meaningfully within a broader explanatory context. The make-up of the final group of interviewees in terms of age, role description, ages of pupils supported, and highest qualification in mathematics, is shown in figures 3.1 to 3.4 below.

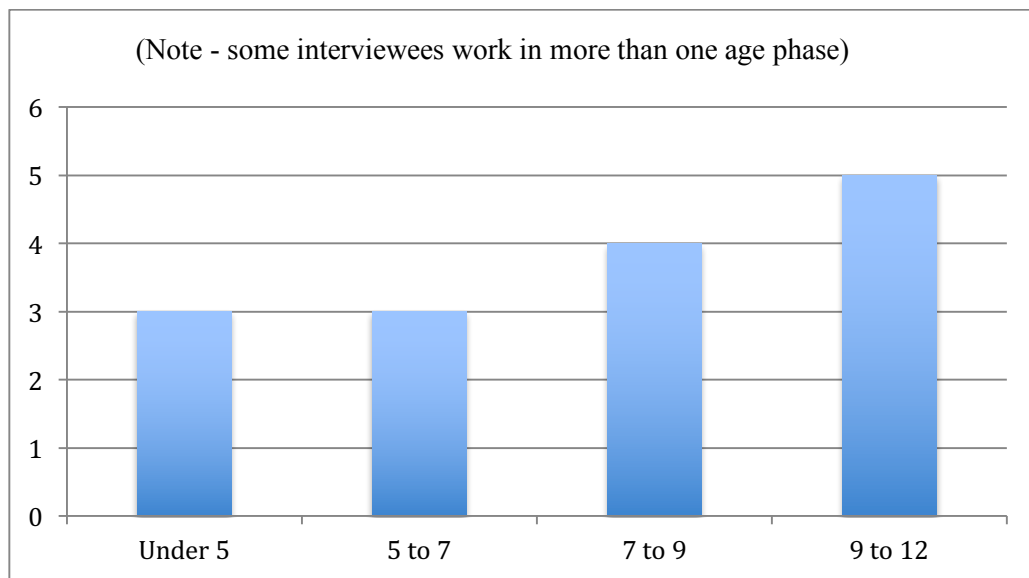
**Figure 3.1 Ages of interviewees**



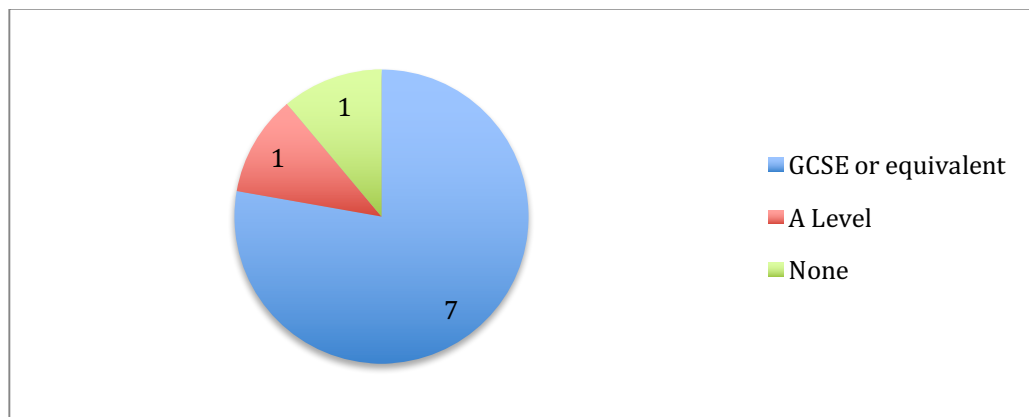
**Figure 3.2 Role descriptions of interviewees**



**Figure 3.3 Age ranges supported by interviewees**



**Figure 3.4 Highest mathematics qualifications gained by interviewees**



I interviewed each teaching assistant twice. A similar approach was adopted by Trent's (2011) study of the CPD experiences of teachers on a short professional development course in Hong Kong, in which the teachers were interviewed immediately after completing the course and then again approximately one month after they had returned to their role in school. As well as enabling me to probe interviewees further on specific themes raised during their first interview, a further interview approximately four months later allowed additional time for students to attempt to apply their learning in their practice and reflect further on the process.

Newby states that semi-structured interviews are structured by ‘an interview guide with topics to be covered as opposed to an interview schedule that has a fixed set of questions’ (2011, p. 340). This differs slightly from Murphy’s approach to semi-structured interviews, in which participants were provided in advance with a schedule of specific questions as a guide that ‘may not be followed exactly depending on your responses and interests’ (2006, p. 248). Murphy’s more prescriptive approach appears to have been related to her use of an interviewer not associated with the taught course, with the aim of encouraging students to exercise greater freedom in their responses.

‘Semi-structured’, therefore, appears open to different interpretations, including the approach adopted for my evaluation, which involved analysing the questionnaire responses to inform the development of the interview schedule for the first set of interviews (see Appendix D). To help facilitate discussion, relevant passages of the second part of the interviewee’s written assignment (see Appendix E), along with any significant questionnaire responses, were used as prompts to invite the interviewees to expand on or clarify what they had written. Revisiting this written data within the interview aimed to draw out deeper insights into the application of university study into practice and other contexts. After mining the two written sources to promote discussion, I then drew on the interview schedule to identify and ask questions about any areas that had not been covered by the initial exchanges.

Prior to the first interviews, I sent each interviewee a copy of their completed questionnaire and the schedule of interview questions (see Appendix D) in advance. The interviews were transcribed and the transcriptions were sent to the interviewees for their approval prior to analysis. Mindful of power relations, I reminded interviewees before the interview that their involvement was voluntary, that they were free to withdraw at any time, that their responses would be anonymised, and that their participation would

not affect their access to tutorial support or the results of their assessments in any way.

Before the second interviews, I read through all of the transcripts from the first interviews and noted down what I considered to be important themes emerging from the data as well as specific comments from individual teaching assistants that I felt required probing further. At this stage, my identification of themes was tentative and not subject to the systematic qualitative coding approaches described in Chapter 5. I contacted the participants by email (see Appendix F) in advance to explain the purpose and overall structure of the second interviews. Based on my analysis of the first interviews, I developed a master schedule of questions for the second interview (see Appendix G), which I then adapted for each interviewee in order to follow up specific points from the first interview. These individualised schedules were also sent by email to the interviewees ahead of the interviews.

Kvale emphasises that in a research interview ‘knowledge is constructed in the interaction between the interviewer and the interviewee’ (2007, p.1). This places a responsibility on the interviewer to plan and carry out interviews carefully, taking ethical considerations fully into account. One aspect of the telephone interviews that particularly concerned me was how to achieve an appropriate balance between building rapport with the interviewees and not ‘leading them into saying things they did not intend to say’ (Mercer, 2007, p. 11). Similar to Mercer’s experience, during the first interviews I found myself occasionally sharing my own school-based and study experiences with the interviewees, even though I had not intended to do so. On reflection, I feel that this was an example of hoping that ‘a more interactive/conversational approach may yield more extensive data’ (Mercer, 2007, p. 10). Although stating that she remains ‘undecided about exactly how far a naïve (or, perhaps, very skillful) interviewer can make people say things they do not actually

mean' (p. 11), Mercer advocates that for research to avoid criticism in this respect, it is advisable for researchers to avoid overly informal interviewing styles. Accordingly, for the second interviews I consciously avoided deviating from the focus of the interview schedule, and refrained from talking about my own related experiences.

A further dilemma I faced during the interviews was how long to allow interviewees to digress from answering the question posed before intervening. In some cases such digression generated, after some meandering, fruitful data in relation to my research questions, but often this was not the case. For one interviewee in particular, it usually led to the repetition of previously given responses. I found that the more disciplined approach I adopted during the second interviews resulted in more productive use of the time allocated for the interviews, but acknowledge that this may have resulted in some unanticipated aspects of the interviewees experiences remaining undiscovered.

### 3.5.3 Documentary sources

Parlett and Hamilton's use of the term 'documentary and background information' covers a wide range of potential source material. These range from documents relating to the planning and setting up of a programme to 'autobiographical and eye-witness accounts' of its enactment and 'examples of students' assignments' (1972, p. 25). These documents can make a valuable contribution to the data, in particular to triangulate findings and highlight aspects of the processes and outcomes of a programme that might not be uncovered through questionnaire and interview data. My evaluation drew on two such sources, the online mathematics discussion forum and the written assignments completed by students at the end of the block.

During my initial planning of this evaluation, I considered using the E207 online mathematics forum as a substantial data source. However, having reviewed the literature relating to the analysis of online forum interaction (e.g. Irwin & Hramiak,

2010; Nandi *et al.*, 2012), I concluded that carrying out a full analysis of students' forum activity would not be possible within the constraints of the EdD programme, given the complexity involved in analysing such data, and the extremely high number of posts on the forum. Indeed there is probably sufficient data within the forum for an entirely separate thesis. Nevertheless, forum posts by individual interviewees offered considerable potential to enrich the data, so I considered it important to draw on these, in part at least, for the following reasons. First, the initial interviews would take place approximately 6 weeks after the interviewees completed the block. By using interviewees' forum posts as prompts to discussion in the interview, I aimed to help 'transport' them back into their study experience, so that by 're-living' part of it in this way, the interview data they contributed might be more detailed. Second, interviewees' forum contributions offered the potential to bring to light aspects of their experience that might otherwise have remained uncovered due to the passage of time.

Students' written assignments can act to corroborate findings from other sources in qualitative research into programmes of CPD and other types of teaching and training (Marrero *et al.*, 2010; Jove, 2011), and therefore were used as a further source of documentary data in this study. In a similar way to their forum contributions, relevant passages of part two of the interviewee's written assignment (see Appendix E) were used as prompts to discussion in the first interview to invite them to expand on or clarify what they had written.



## **Chapter 4 Initial study**

### **4.1 Introduction**

In accordance with the requirements of the EdD programme, an initial study was undertaken with students from the October 2012 to June 2013 presentation of E207. The research question for the initial study was:

What are the outcomes of the work-based-based learning of teaching assistants relating to their mathematical subject knowledge on their work supporting children's learning in mathematics in school, and on their wider experience at home and in their community?

I subsequently refined this question for the main study.

Data collection was via a questionnaire completed by 109 students and a follow up interview with one student (I had hoped for more). The questionnaire comprised closed and open questions relating to teaching assistants' experiences studying the block, as well as questions to elicit demographic and other background information about the participants.

### **4.2 Data analysis**

Analysis of the questionnaire data suggested that in most cases, students reported positive outcomes in terms of confidence in their own mathematical ability, their ability to help develop children's mathematical learning and their attitude towards mathematics generally as a result of their study of the block. During the block students are required to engage with a range of content and pedagogical approaches (see Chapter 1) and there was considerable variation in the extent to which each of these approaches reportedly contributed to the outcomes for individual students. However, the questionnaire



responses in the initial study suggested that the module reader and the classroom-based workbook activities were consistently strong contributors to what students described as a successful learning experience.

A notable feature of the questionnaire data was that, in spite of the positive outcomes described above, data identifying specific outcomes relating to teaching assistants' practice was less forthcoming. This was the case to an even greater extent in relation to changes in children's engagement and learning, echoing Joubert & Sutherland's (2008) conclusions about the difficulty of capturing data relating to these.

The hypothesis was put forward that changes in pupils' learning and behaviour may have been more extensive than revealed in the questionnaire data, but that because of the non-measurable nature of these changes in many cases – and therefore perhaps a lack of explicit value attached to them – they are often hidden, including from the teaching assistants themselves. The notion of hidden or unacknowledged outcomes appeared to be reinforced by the number of teaching assistants who identified their own increased confidence as the main supportive factor for transferring their learning into classroom practice.

A key theme to emerge from my interview with one student, Emma (not her real name), was the potential influence on teaching assistants' learning from the block of what might be described as their individual hinterlands comprising their wider life experiences and other qualifications. Emma's interview also suggested that most of the outcomes in Harland & Kinder's (1997) framework appeared to be applicable to teaching assistants undertaking a block of study. A sizeable minority (30.2%) of students reported that following their study of the block they still felt unable to make suggestions to, or had not benefitted from opportunities to work more collaboratively, with the class teacher.

### 4.3 Implications for the main study

Analysis of the data from the initial study resulted in refinements to the questionnaire for the main study, and identified the need to invite a larger number of students to be interviewed in order to avoid a potentially low take up, and to recruit a reasonably representative group of interviewees.

In relation to the scarcity of data relating to changes in pupils' learning and behaviour, I anticipated that interview data from more teaching assistants, and over a longer period of time, might enable the extent of any outcomes attributable to their study of the block to be uncovered in greater detail. Similarly, I considered that further interview data might help to illuminate the exact nature of the increased confidence relating to classroom practice reported by many teaching assistants in their questionnaire responses, and the contexts in which they feel able to enact it.

I also concluded that Harland & Kinder's (1997) hierarchy appeared to be an appropriate model to take forward into the main study, although I anticipated that the framework might need to be adapted to include additional outcomes, for example the precise meaning of 'increased confidence'.



## Chapter 5 Questionnaires

### 5.1 Introduction

For the main study, questionnaires were completed by a subset of the cohort studying E207 between October 2013 and June 2014. Sixty-seven out of the 214 students invited completed the questionnaire, representing a response rate of 31%. For a web based survey this can be considered to fall within an acceptable range when compared to the nine course and teacher evaluation surveys reviewed in Nulty's (2008) study, which generated online response rates between 20% and 47%. A more recent comparison with a cohort of continuing students on a professional programme similar in size to the block is provided by Gale *et al.*'s (2015) evaluation of nursing students' experiences during the first year of their degree, which produced a response rate of 96 out of 256 students (37.5%) to an online questionnaire. Whilst Bryman describes response rates for online questionnaires in this kind of range as 'respectable' (2012, p. 675), I acknowledge that the 31% of invited students who took part in my evaluation cannot, of course, be considered as representative of the entire cohort. It is possible, for example, that because they knew the questionnaire formed part of a doctoral study, students who felt negatively about the block may have been less motivated to respond than for an institutional request from the OU for feedback on a studied module.

This chapter describes and analyses the data generated by the questionnaires. As for the analysis of the interview and documentary data that follows in Chapters 6 and 7, the discussion in this chapter is structured in relation to each of the study's two research questions:

- What are the ways, if any, that studying a work based distance learning block of study has an effect on teaching assistants' confidence and

attitudes towards mathematics, and their work supporting children's learning?

- What is the nature of the experiences that teaching assistants encounter as they study and draw on their new mathematical learning in their school practice and wider experience?

The first question relates primarily to the outcomes of these teaching assistants' study, whereas the second question is concerned with the processes involved and what it feels like to be participating. Although, in analysing the data, it is at times difficult to separate out these two strands, the focus within Section 5.2 is on the former and in Section 5.3 on the latter.

## 5.2 Outcomes

Quantitative data from the questionnaires were analysed and yielded descriptive statistics to provide an overview of frequencies. Tables setting out this quantitative data relating to outcomes are included as Appendices H and I.

In considering the outcomes of students' study, it was relevant that over half of the sixty-seven respondents agreed or strongly agreed that they felt confident in their own mathematical ability prior to starting the block, with a similar proportion stating that they had a positive attitude towards mathematics generally at this point in time (see Appendix H). A slightly higher percentage (65.7%) reported that they felt confident in their ability to support children's learning in mathematics prior to starting the block. A large majority of respondents (80.6%) stated that they were confident when working alongside teachers in a mathematics lesson, although a much smaller proportion (47.7%) reported that they were confident to make suggestions about mathematics activities and approaches to the class teacher before starting the block.

Notwithstanding these reported level of confidence and positive attitudes prior to starting the block, responses regarding confidence in and attitude towards mathematics after completing the block indicated a considerable shift from less towards more confident and positive (see Appendix I). A large majority of respondents (94%) agreed or strongly agreed that after completing the block they felt more confident in their own mathematical ability, and 92.5% stated that their study of the block had resulted in them feeling more positive about mathematics generally. An even more overwhelming majority (98.5%) considered that completing the block had increased their confidence in their ability to support children's learning in mathematics. It is of note, however, that 14.9% of respondents reported that the block had not resulted in them becoming more confident to make suggestions about mathematical activities and approaches to the class teacher.

The two questions relating to outcomes that requested a qualitative response (see Appendices J and K) were analysed using an approach based on that used by Murphy in her research discussed in Chapter 3 'so as to include all responses in a meaningful way' and to 'identify common and unique responses' (2006, p. 234). Fifty students provided a response to the open comment question 'Have you noted any changes in pupils' behaviours, attitudes, attainment and learning which you consider to have resulted from changes in your practice? If so, please describe these'. Fourteen respondents provided an explicitly negative answer to this question, with seven stating 'no', five stating 'not yet' or similar for example, 'Too recent to say only supported one session!' (teaching assistant, 15/1/2014) and two stating 'not applicable'.

The remaining thirty-six responses referred to a positive outcome from the block. However, fourteen of these thirty-six responses were not applicable to the question, in that they suggested a positive outcome in terms of a teaching assistants' practice without directly describing any changes in pupils' behaviours, attitudes, attainment and

learning, for example ‘I am more flexible and have started to use terminology more in front of the children’ (teaching assistant, 12/1/2014). This apparent reluctance to describe changes in pupils’ behaviours, attitudes, attainment and learning, echoes existing evaluation literature on short-term programmes. However, what such responses do suggest is that these teaching assistants have developed their practice to a level that is arguably closer to teaching than merely providing ‘support’. The remaining twenty-two responses were categorised according to four codes, as shown in Appendix J. However, it is again of note that the majority of these responses described the changes only in very general terms, the most common being ENG: increased engagement/enthusiasm/enjoyment.

In fourteen of the twenty-two responses identifying a change in pupil learning or behaviour, the respondent specifically attributed the reported outcome to a change in their own practice, for example:

‘The children now seem more enthusiastic, and eager to participate ... in mathematical activities. I think this is due to giving the children the chance to investigate, discover and explore materials at their own pace’

(teaching assistant, 12/1/2014)

Even more so than in the previous example, it can be argued that the approaches this respondent describes having introduced to her practice, and the decision-making that presumably accompanies them, very much ‘look like teaching’ to use Dillow’s (2010) phrase.

Finally, forty-five students provided a response to the question ‘has your study of the block had an impact beyond your OU study and beyond your role in school (for example within your family and circle of friends, any other work roles or your wider community)? If so, please describe this’. Three responses were not relevant to the

question, and fifteen respondents stated that their study had not had a wider impact. The remaining twenty-seven respondents described an impact beyond their OU study and role in school, including one respondent who identified two areas (see Appendix L). Twelve of these responses reported increased confidence to be able to support their own children's learning in mathematics (SUPP-CHN), for example 'I am now not intimidated by [my daughter's GCSE] questions' (teaching assistant 16/1/2014). Eight indicated that confidence in their own mathematical ability (CONF-MATHS) had improved, including a comment that 'I'm able to do things I couldn't do before' (teaching assistant 13/1/2014). Such responses again are indicative of teaching assistants' growing mastery of mathematical subject knowledge that may enable them to directly teach rather than 'support' children's learning. Four students identified specific examples of how their study had had an impact within their school that extended beyond their existing role (WIDER-SCH), for example helping a friend revise for a numeracy test required for entry to initial teacher training.

### 5.3 Processes and experiences

Students were asked to evaluate each of the individual components making up the block (see Appendix L). Analysis of these quantitative responses suggests that the different elements of the block contributed to the experience mainly in positive ways, but that nevertheless certain components were rated considerably more positively than others. Of particular note was that 100% of respondents stated that the reader (Haylock, 2010) formed a useful part of their learning experience, with a much higher percentage (94%) citing 'very useful' than for any other component. 100% of respondents also responded very positively to the classroom-based workbook activities, with nearly two thirds of all respondents stating that the workbook made a 'very useful' contribution.



As explained in Section 1.3, the mathematics block is the second of five blocks that make up the module, and during the first block students complete and reflect on subject knowledge audits in English and mathematics. The mathematics block requires students to reflect further and follow up the outcome of their audit as part of the ‘online readings and activities’ included in Appendix J. As I discuss subsequently in Chapter 6, responses to and feelings about the audit emerged as significant contributors to interviewees overall evaluation of the block, and I therefore acknowledge that with hindsight it was an omission not to include the audit as a distinct component in the questionnaire.

Turning to the qualitative data relating to processes and experiences, fifty-four students responded to the open question, ‘please identify and explain any factors that have supported you in using what you have learned from the block in your classroom practice’, producing fifty-three responses that were applicable to the question (see Appendix L). Some of the lengthier responses related to more than one code, for example ‘My mentor has been very encouraging, allowing me to practise the areas I identified for improvement. Haylock’s book is a fantastic tool’ (teaching assistant, 14/1/2014). The most common supportive factor, identified by thirty-eight respondents was UNST-CONF: increased understanding and/or confidence, essentially a ‘within person’ factor. Responses such as ‘I feel more confident in maths terminology and refreshed my general knowledge on the subject’ (teaching assistant, 13/1/2014) and ‘understanding the principles of maths, the how and why’ (teaching assistant, 12/1/2014) convey a sense of teaching assistants getting to grips with the subject in a deep and meaningful way. The module reader was also cited to a significant extent (fifteen responses), echoing the quantitative data, and seven respondents identified the online mathematics forum as a supportive factor. Relatively few students referred to the school context, with only four respondents referring to the openness of their class

teacher or mentor (OPEN-CT) and the same number citing the openness of their setting (OPEN-SET) to embrace their learning.

Forty-five students responded to the question ‘please identify and explain any factors that have inhibited you in using what you have learned from the block in your classroom practice’, resulting in forty responses that were relevant to the question. However, eighteen of these forty respondents stated that they had encountered no inhibiting factors, with the remaining twenty-two identifying factors that had inhibited them (see Appendix N).

One inhibiting factor in particular stands out: IRR-PUPIL (perceived irrelevance of the block content in respect of pupils supported by a student) as more frequent responses, cited by more than a half of respondents who provided a relevant response to this question. Most of these were working in an early years setting, and commented that they felt that content of the block was more applicable to an older age group than the one that they worked with.

The remaining inhibiting factors cited related to constraints (actual or perceived by the teaching assistant) relating to the school context, the most common being TIME (time constraints) (four responses), NO-OPP (lack of opportunities to input into the planning process) (three responses) and WARY (wary/nervous about making suggestions) (two responses).

## 5.4 Summary

Overall, the questionnaire data suggest that a significant outcome of the Block for many of the teaching assistants who responded was that they had moved forward in their ability to draw upon their OU learning for collaborative classroom practice. This suggests, to some extent, greater teacher receptivity to teaching assistants’ self-initiated

study and maybe more porous teacher professional boundaries than were reported in earlier studies (e.g. Hutchings, 1997; Swann & Loxley, 1998; Morris, 2009; Edmond, 2010).

For many of these teaching assistants, an important factor in enabling them to extend or strengthen the teaching element of their practice, was the way that their study resulted in them getting to grips with mathematics as a subject in a deeper way, and the resulting confidence and sense of increased professionalism that this gave to their practice and relationships with adults and children in school. Such positive outcomes were not universal, however, and therefore in the subsequent interviews, I probed further into how the interviewees' study experiences contributed (or not in some cases) to them working more collaboratively alongside teachers, and sought to investigate the nature of the increased confidence reported by many.

Another area of interest emerging from the interview data, relating to the second research question in particular, was the interaction of teaching assistants' wider life experiences and qualifications with their study of the block, both in terms of how they approached their study, and its outcomes relating to their practice and wider experience. This was therefore specifically focused on in the interviews.

## **Chapter 6 Interviews and documentary sources**

### **6.1 Introduction**

In this chapter I begin to present my interpretation of the interview and documentary data. The chapter begins, in Section 6.2 with an overview of the nine interviewees to set the scene for the analysis that follows.

In my initial analysis of the data, presented in this chapter, my focus was primarily on the first of my two research questions:

What are the ways, if any, that studying a work based distance learning block of study has an effect on teaching assistants' confidence and attitudes towards mathematics, and their work supporting children's learning?

In particular, I focused on outcomes relating to the interviewees' own practice and pupils' learning and behaviour. My approach to analysing this data, and my initial interpretation of them, are presented in Section 6.3. In Section 6.4, I build on this to suggest a hierarchy of outcomes for the block adapted from Harland & Kinder's (1997) ordering of INSET outcomes.

The analysis outlined above precedes my more detailed consideration, in Chapter 7, of the interview data with a specific emphasis on my second research question:

What is the nature of the experiences that teaching assistants encounter as they study and draw on their new mathematical learning in their school practice and wider experience?

## 6.2 The nine interviewees

As explained in Section 3.5.2, nine practitioners were interviewed. To ensure anonymity, the names of all interviewees have been changed in the discussion of the data that follows. At the time of the interviews, eight were in teaching assistant roles and one, Susan, was a nursery manager. Eight were interviewed on two occasions, but Susan was not available for a second interview (See Appendix P for a detailed overview of the interviewees).

The interviewees ranged in age from 21 to their early 50s. Six had gained A levels or equivalent, three (Tanya, Steph and Susan) left school at 16. Two students, Zoë and Lesley, did not have a GCSE (or equivalent) in mathematics; Lesley had failed the examination three times. Both of these students stated that they had started the block lacking in confidence and with negative feelings towards mathematics. One of the students who had passed GCSE mathematics, Karen, was nevertheless aware that her own experiences of mathematics had been ‘very Victorian, taught by rote’ (23/3/2014). The remaining six interviewees stated that they had started the block feeling confident and positive about their own mathematical ability, although most had anticipated that the block would improve their ability to support children’s learning. However one of them, Tanya, expressed afterwards that it was a ‘pleasant surprise’ to realise she had learned so much from the block as she thought she ‘wouldn’t get much out of it’ (13/4/2014).

The stated final study aim of eight of the nine interviewees was to achieve a full degree; only Karen was intending to stop after completing the Foundation Degree. Three of the interviewees said that their definite aim was to achieve qualified teacher status; another, Hannah, said that it was likely she would eventually try to become a teacher. Two others said it was possible that they might attempt to achieve QTS. Three had no

ambitions to gain a teaching qualification, one of who, Gina, considered that she was ‘too old’ (20/3/2014). Another, Susan, was a nursery manager and intended to remain in the role.

Seven interviewees considered that their schools were supportive of the professional development of teaching assistants, with the nature of this support reported to be especially strong in four cases. In the two schools where the approach to CPD was stated to be limited, both interviewees said that they understood plans were in place to address this in the following academic year.

### 6.3 Outcomes relating to students’ own practice and pupils’ learning

The first stage in my analysis of the interview and documentary data was to identify and consider the outcomes of the block relating to the interviewees’ own practice and pupil outcomes. All interviewees reported that their study of the block had resulted in positive outcomes in respect of their practice. The same process as for the open questionnaire responses (see Sections 5.2 and 5.3) was used to analyse all statements made by interviewees that specifically referred to ways in which their study of the block had enabled them to develop their own practice. Table 6.1 below provides an overview of positive outcomes relating to practice identified by three or more of the nine interviewees.

**Table 6.1 Codings and definitions of categories of positive outcomes relating to practice**

Code	Definition	Illustrations	Number of interviewees
IDENT	Identifying where children are in their learning, gaps in knowledge and understanding; misconceptions	'... being able to tell the difference between ... a silly mistake or if it's a misconception ... that's where my confidence is now, being able to pull apart what they're doing'	6
VISUAL	Incorporating visualisation activities	'... mental imagery and everything like that ... I work really hard on that now'	6
CHANGE	Having confidence to make changes to activities	'...it's given me more confidence to say - Actually no, I'm going to try something else until this child gets that before I move on'	6
MANIP	Greater or more effective use of manipulatives and other resources	'... there's no point in just telling them to count in fives. I might say "OK, we're going to do it with counters ..."'	5
VOCAB	Greater or more accurate use of mathematical vocabulary	'... using the correct terms and vocabulary. I feel really quite strong in that now'	5
CONF	Projecting greater confidence to the children	'I'm coming across as more confident, definitely'	4
CREATIV	Encouraging or allowing for greater creativity by children	'It's helped me to be a lot more creative'	3
PLAN-DET	Planning in more detail	'My plans have now extended from writing something like 'subtraction game' to ... a couple of sentences'	3

PLAN-	Greater input in collaborative	‘when [the teacher] is	3
COLLAB	planning with class teacher	planning, she often asks me for my opinion’	

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Note – Number of interviewees = the number of interviewees (from the nine interviewed) who provided at least one specific example of the relevant category.

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A common characteristic of many of the examples represented in Table 6.1 is the extent to which they ‘look like teaching’ (Dillow, 2010, p.10), in how they enabled the interviewees to work with the children in a much more ‘fine-grained’ way, a term used by Gross in relation to assessment of ‘special needs in maths’:

‘[to] pinpoint where in particular the child has not succeeded in grasping essential foundation concepts ...and of any underlying reasons for the mathematical difficulties.’

(Gross, 2002, p. 212)

As discussed in Chapter 1, a high proportion of teaching assistants’ time is typically spent working with individuals or small groups of children who are experiencing difficulties in mathematics or language and literacy, and they are therefore close at hand to notice what children are unable to do. However, this is not the same as understanding why they are unable to do something, and therefore ‘being able to pull apart what they’re doing’ (Karen, 4/8/2014) and having the confidence to respond accordingly seems like a significant development in these teaching assistants’ practice. There is in fact a sense that they are developing the confidence and ability to teach effectively. This is especially so, given that the children who teaching assistants work with are often those who most challenge the skills of their teachers. With this in mind, the data summarised in table 6.1 suggests that for these nine interviewees, the block not only helped them adopt a fine-grained approach in their identification and assessment of



children's learning needs, but that it also enabled them to develop their own teaching practice, for example by using manipulatives in a more focused way, or feeling confident to adapt activities part-way through in reaction to children's response to them. This is attention to the detail of practice in relation to the content of children's mathematical learning. Hancock outlines a similar sense of precision in the close pastoral support that many teaching assistants are able to provide to produce 'a productive balance between nurture and progressing a planned learning activity' (2013, p. 301). There seems a strong basis, therefore, to argue that teaching assistants' capacity to combine fine-grained subject related and 'therapeutic' (Hancock 2013, p. 301) pedagogies in their practice places them in a position to make a real difference in helping children to progress in their learning. The notion of a 'productive balance' seems particularly important. Class teachers 'because of their responsibility for a large number of children, tend to be more formal, instructional and, necessarily, distanced from children as individuals' (Hancock, 2013, p. 302). However, whilst teaching assistants are often well placed to provide the necessary close pastoral and therapeutic support, there is a danger that this can be taken too far and result in individual children becoming over-reliant on the support or even, a teaching assistant doing things to 'help' a child, that the child should be doing for themselves. This seems more likely when a teaching assistant is required to work with children without possessing the necessary knowledge, understanding and confidence to identify and point out to them where they have gone wrong, and help them appropriately to develop understanding. Where they are equipped in this way, however, there is a strong argument to be made that teaching assistants' input should more accurately be described as teaching, as 'support' would seem to underplay what they are doing.

The responses discussed above paint a very positive overall picture in terms of the interviewees' self-reported outcomes from their study of the block on their practice in

school, although further data from observations and interviews with their respective class teachers would be needed to triangulate these findings and strengthen these claims. The reported effect on classroom practice was not always as positive, however. Echoing data from the questionnaire, some of the interviewees alluded to factors that they felt reduced the extent they were able to draw on their study of the block in their support practice. For example, Lesley considered that the ‘pressures’ that teachers are under can manifest themselves in:

‘... rigidity, they’ve got their year’s worth of lessons planned and they’ve always done it like this, and the thought of bringing something new in isn’t always hugely appreciated’

(Lesley, 17/3/2014)

However, as in the questionnaire data, relatively few constraints were reported by the interviewees in comparison to the examples of positive outcomes. Whilst this is encouraging in terms of evaluating the block, these findings should be qualified in relation to the possibility, discussed in Section 4.3, that students who felt negatively about their study may have been less motivated to respond to a request relating to doctoral research than an institutional request for feedback.

The outcomes described by some interviewees went much further, both within their school and in relation to their wider experience. For example Gina reported that her mentor, who was also the headteacher, had remarked during a discussion of the mathematics audit that ‘really, these are things that every TA should know’ (20/3/2014), which led to the school carrying out a similar audit with all teaching assistants in order to identify development needs and put training in place.

Further examples of wider impact described by the interviewees included:

- schools buying resources suggested by teaching assistants

- ‘new’ ideas for activities and approaches from the reader (Haylock, 2010), and ideas suggested by teaching assistants on the mathematics forum being used widely in a school
- teaching assistants contributing to INSET
- teaching assistants supporting their own children’s (or younger siblings’) learning
- the teacher of a teaching assistants’ child using ideas and resources from the block
- a teaching assistant being approached to tutor a child
- a teaching assistant being asked to help a friend study for PGCE numeracy test

In the interviews, teaching assistants talked about changes in the learning and behaviour of individuals and groups of children. Karen, for example, was quite specific in expressing her belief that the improvements made over the school year by some children who had been ‘struggling’ with number bonds and times tables, were the result of changes in practice by the classroom teaching team triggered by her study of the block:

‘We just stripped their maths right back ... and that’s how they made their progress. We filled in all their gaps, gave them all the strategies they needed. We had lots of discussions about how we were going to solve the problems, what maths they needed and without studying the block I wouldn’t have been able to feed back to my teacher and say ‘look, I think if we do this and if we do that ...’ Yes so without doing the OU ... we wouldn’t have had the small groups, we wouldn’t have had the maths discussions.’

(Karen, 4/8/2014)

Notwithstanding the need to treat self-reported claims with caution, this is a powerful testimony of positive outcomes from one student’s study of the block. Other

interviewees, whilst reporting changes to their own practice were more guarded in talking about pupils’ learning outcomes, for instance:

‘I don’t know if [the children’s greater willingness to contribute during small group activities] is because of the maths block or just because they’ve adjusted with time, there are so many variables.’

(Zoë, 31/7/2014)

Given that the data overall reinforced earlier research that found that changes to practice can be identified and claimed more securely than those relating to children’s learning, the focus in the next section is on the outcomes reported by the interviewees relating to their practice in school.

### 6.4 Adapting Harland and Kinder’s hierarchy of outcomes

Harland and Kinder’s hierarchy, which was introduced in Section 2.4, was, as previously stated, developed in relation to CPD for science in primary schools:

**Figure 2.2 Harland and Kinder’s ordering of INSET outcomes**

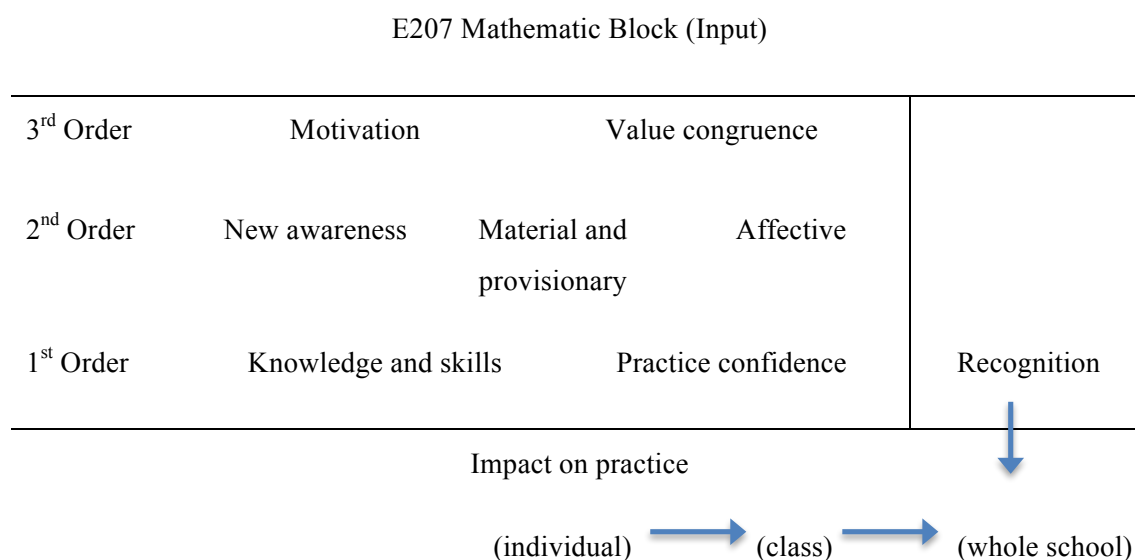
INSET input			
3rd Order	Material and provisionary	Information	New awareness
2nd Order	Motivation	Affective	Institutional
1st Order	Value congruence	Knowledge and skills	
Impact on practice			

(Redrawn from Harland and Kinder, 1997)

As explained earlier, the outcomes set out in figure 2.2, which relate to the impact that the CPD had on the participants, provided a possible framework for analysing the interview data, and I decided to go ahead with my initial processing in this way for two reasons. First, to help me get inside such a large amount of data, I felt it would be beneficial to start by concentrating on a specific and central aspect of the evaluation, outcomes relating to teaching assistants' practice. Secondly, Harland & Kinder's hierarchy is a well-established framework, relevant to my evaluation in that it considers the impact of INSET on the professional practice of teachers. Exploring the appropriateness of the framework in relation to teaching assistants, a related but distinct group of practitioners, provided the opportunity for my own work to build on existing research and theory in an informative way.

As I attempted to apply Harland & Kinder's model, by assigning statements made by the interviewees, to each of the eight outcomes in the hierarchy of INSET outcomes, it became evident that some of these outcomes did not represent a good fit for the block. Additionally I found it necessary to add further outcomes in order to adequately capture the range of teaching assistants' experiences during and following their study of the block. It also became clear that the relative position within the hierarchy of some of the outcomes required adjustment. Therefore, at this point, I revisited the questionnaire responses and reflected on these in conjunction with my initial analysis of the interviews and documentary sources to develop a tentative hierarchy of outcomes for the block, building on Harland & Kinder's framework (see Figure 6.1 below).

**Figure 6.1 Hierarchy of outcomes for the E207 mathematics block**



Adapting the hierarchy in this way preceded my more detailed drawing out of the key themes that I set out and discuss in Chapter 7, and was a pivotal staging post in the thinking processes that led to the identification of these themes. The hierarchy presented in Figure 6.1 retains the central principle of Harland & Kinder’s model - that the presence of first order outcomes are highly likely to feature in examples of substantial impact on practice, but that such outcomes may additionally require or be significantly supported by the presence of other outcomes lower in the hierarchy. However, my adapted hierarchy differs from Harland & Kinder’s in a number of important ways.

First, ‘informational’ outcomes, which Harland and Kinder define as awareness of ‘background facts and management developments’ (1997, p. 73), did not feature in the block, and therefore are not included in the adapted hierarchy. Second, I have moved ‘material and provisionary’ outcomes up from a third to a second order outcome. Harland and Kinder define such outcomes quite narrowly as ‘the physical resources which result from participation in INSET activities (e.g. worksheets, equipment, handbooks and time)’ (pp. 72-73). The role of the mathematics reader (Haylock, 2010) in strengthening the interviewees’ knowledge, skills and confidence (1<sup>st</sup> order outcomes

in the adapted hierarchy), emerged strongly from the questionnaire data (see Section 5.3), and was reinforced in the interview data as discussed later in Chapter 7. Additionally, the interview data suggest that for the block, Harland and Kinder's definition should be widened to include web-based and physical resources that were not part of the core module materials, and that these resources too had a strong influence on the teaching assistants' knowledge, skills and confidence. For example, through her engagement with other students on the mathematics forum, Lesley became aware of a range of websites, which she found 'brilliant', and also told other teachers in her school about. Interaction with other students also made her aware of national guidance documents already available in her school, which she subsequently drew on in her assignment and used 'constantly' to support her practice (17/3/2014).

The third change from Harland & Kinder's hierarchy is the relegation of 'value congruence' from a 1<sup>st</sup> to 3<sup>rd</sup> order outcome. Harland and Kinder describe 'value congruence' as the extent to which practitioners' 'individuated codes of practice come to coincide with the INSET providers' 'messages about good practice' (p. 73). The term 'come to' is crucial here. Harland & Kinder discuss the difficulties experienced by some primary mathematics and science coordinators when carrying out INSET with colleagues relating to the introduction of the New National Curriculum in England in the early 1990s. In cases where such colleagues did not share the same values as those held by the subject coordinators (or promoted by them in introducing government policies or initiatives), value congruence did not occur and impact on classroom practice was limited. Many of the evaluations of CPD in the 1980s and 1990s discussed by Harland & Kinder were related to government initiatives, and therefore the training involved may in some cases have been at odds with what practitioners, maybe including those leading the CPD themselves, viewed as effective practice. The situation for the practitioners in my evaluation, however, is different. Their development as learners is

self-driven, most are hungry for and receptive to new ideas and skills that will enhance their work with children, and they believe that their study with the OU will support this. As discussed in Chapter 2, teaching assistants may often be better positioned than teachers to develop their practice in alignment with their own strengths and interests (Graves, 2013). When Gina was asked what she perceived were the key teaching points in the block, these were often in harmony with her own thinking:

‘... it’s important for them to get hands-on, and visual as well, like where I will use the place value boards for the children to see, not just adding a zero ... how important the cross-curricular approach is, like with the data – not just getting something out of a book ... they can see a purpose for it as well.’

(Gina, 20/3/2014)

Therefore, although one outcome of the block for many participants may have been to strengthen the value congruence between the block’s underpinning beliefs about mathematics and their own, I am positioning it in the adapted hierarchy as less influential than in Harland & Kinder’s. This positioning is based on my interpretation of value congruence as a mindset that many participants brought with them to their study of the block, perhaps underpinned by their confidence in the OU through its reputation and their experience on previous modules, as opposed to one they came to develop as an outcome of their study of the block. For the same reasons, I have also placed motivation, as an outcome, at the same level as value congruence.

A further adaptation is the elevation of ‘new awareness’ from a 3<sup>rd</sup> to a 2<sup>nd</sup> order outcome. Harland and Kinder define ‘new awareness’ as ‘a perceptual or conceptual shift from previous assumptions of which constitutes the appropriate content and delivery of a particular curriculum area’ (p. 73). As suggested in the previous paragraph, these interviewees appeared to approach their study of the block open to new



ideas, and so the shift for them was more about a new awareness, for one even ‘a hallelujah moment’ (Karen, 23/3/14), of how to support children’s mathematical learning effectively rather than a fundamental shift in existing assumptions. In Zoë’s case, this new awareness related to the abstract nature of mathematics and ways to help children overcome difficulties caused by this:

‘... lots of children’s learning is quite abstract, but if you can make it relevant and meaningful, that helps significantly, and Haylock writes about that a lot ... I could talk all day and it wouldn’t make much sense to them, but if they can see, say arrays, because children that I work with struggle with multiplication ... they can see those numbers growing in the same amount each time.’

(Zoë, 31/7/2014)

In this response, Zoë conveys having developed a new awareness of the processes involved in children’s mathematical learning in an overarching way, but also in terms of a specific teaching approach for integrating this new awareness into her practice. Consequently there is perhaps some overlap here between ‘new awareness’, as I have conceptualised it, and ‘knowledge and skills’, highlighting the complexity and interrelatedness of the processes at work.

A fifth, and significant, adaptation to reflect students’ experiences on the block is my introduction of a new outcome, ‘practice confidence’, to accompany ‘knowledge and skills’ as a 1<sup>st</sup> order outcome. As reported in Section 4.3, teaching assistants’ increased confidence and/or understanding was the most common factor identified in the questionnaire responses as supporting the use of their learning from the block in their classroom practice. As alluded to earlier, this increased confidence presented itself in a range of ways, for example through greater self-assurance when engaging with children on a mathematical activity, or the removal of anxiety about making suggestions to a

teacher. The nature of students' confidence and its development is discussed in detail in a number of the themes that I set out in Chapter 7. For the purposes of the hierarchy, however, I settled on the term 'practice confidence' as an umbrella term to include reference to the arena in which the confidence plays out.

Harland and Kinder's 'institutional outcomes' relate to the potential for INSET to have 'an important collective impact on groups of teachers and their practice' through the 'benefits of consensus, shared meaning, collaboration and support when attempting curriculum innovation in the classroom' (p. 76). This is less applicable to E207 students, who in the main attempt to translate their learning from the block into practice as individuals. However, as discussed later in Chapter 7, the teaching assistants in this study did engage in collaboration and offer mutual support as an online community of learners in a way that had a positive impact on their individual practice. For my adapted hierarchy, though, I have conceptualised this collaboration and peer support as part of the process that contributes to the development of the 1<sup>st</sup> order outcomes of knowledge and skills and practice confidence. That is not to say that the learning of individuals did not have an impact in their setting beyond their immediate sphere of practice. In a number of cases, teaching assistants' learning on the block did result in institution-wide outcomes. For example, in her interview Gina reported that the head teacher set up some specific training in mathematics for all teaching assistants in the school as a direct result of talking to her about her study on the block. In my adapted model such outcomes are represented in the 'impact on practice' section of the figure.

I have substituted 'recognition' in place of 'institutional' as an outcome of teaching assistants' study of the block. Whilst 'recognition', like Harland and Kinder's 'institutional outcomes', relates to a student's setting, it is something that students receive as individuals as a result of their study rather than an effect that is achieved collectively. An example was provided by Amanda when she said that as a result of

study related questions she had asked teacher colleagues, ‘...they took me more seriously because they realised I wanted to learn, I wanted to know’ (31/7/2014).

As in Harland and Kinder’s hierarchy, ‘impact on practice’ is included in my model as recognition of ‘the ultimate intention to bring about changes in practice’ (1997, p. 76). The final two rows of the adapted model illustrate how this can range from impact confined largely to an individual’s practice to impact at a much wider institutional level. A key factor determining the level of impact appears to be how far a particular teaching assistant’s learning achieves recognition within their setting. For example, Karen reported how the support staff in her school are largely ‘left to get on with it’ (4/8/2014), and consequently the outcomes she described focused exclusively on specific groups of children and not the setting more widely. In contrast, Gina’s achievements on the OU’s Foundation Degree were recognised in the school’s newsletter and in a whole school celebration assembly.

## 6.5 Summary

In this chapter, my analysis of the interview and documentary data has focused on outcomes from the block relating to the interviewees’ own practice and pupils’ learning and behaviour. A key finding to emerge is that many of the examples of practice described by the interviewees can be considered as much more closely resembling ‘teaching’ than the less influential term ‘supporting learning’. There is evidence here to suggest that, in respect of mathematics, their learning from the block has been instrumental in moving the practice of many of this study’s participants into the sphere of teaching.

I have suggested the outcomes relating to ‘knowledge and skills’ and ‘practice confidence’ along with the extent to which a teaching assistants’ study receives recognition in her school appear to be the most influential factors contributing to a

positive impact on individuals' practice. In the following chapter, the study processes and the nature of teaching assistants' experiences that interact to influence teaching assistants' learning on the block are considered, focusing in particular on Lave & Wenger's work on legitimate peripheral participation and communities of practice.



## Chapter 7 Eight key themes

### 7.1 Introduction

In this chapter, my focus shifts from my first research question to the second:

What is the nature of the experiences that teaching assistants encounter as they study and draw on their new mathematical learning in their school practice and wider experience?

Building on my analysis of the data included in the previous two chapters, this chapter set outs (in Sections 7.3 to 7.10) the following eight key themes that were identified using the process that I describe and explain in Section 7.2:

- The study process
- Revelation and affirmation
- Being equipped
- Confidence
- Trajectory
- Status and recognition
- Learning territories
- E207 as a community of practice?

It is important to state here that, although the primary focus within this chapter is on study processes and teaching assistants' experiences during and relating to the block, the titles of the of the themes 'Being equipped', 'Confidence' and 'Status and recognition' might be more accurately thought of as outcomes rather than processes. However, whilst the emphasis within these three themes is on the key processes and experiences that appear to have contributed to these outcomes, their titles are also

indicative of the complex nature and interrelated elements that make up individuals' learning on the block.

## 7.1 Establishing the themes

The interview and documentary data were substantial. I therefore sought an approach to thematic analysis of the study processes and teaching assistants' experiences that was manageable, but that would not lose too much of the richness of 'what it is like to be participating' (Parlett & Hamilton 1972, p. 11). I was drawn initially towards Charmaz's (2006) more constructivist adaptation of the grounded theory approaches originally proposed by Glaser and Strauss (1967), and subsequently developed, for example, by Strauss and Corbin (1994, 1998) and Glaser (1992). Charmaz's approach, which conceptualises grounded theory methods as set of principles and practices as opposed to an explicit prescriptive set of procedures, contends that:

'... neither the data nor theories are discovered. Rather we are part of a world we study and the data we collect. We *construct* our grounded theories through our past and present involvements and interactions with people, perspectives, and research practices.'

(Charmaz, 2006, p. 10)

This approach appealed to me because it offered the prospect of allowing the data rather than my own preconceptions to lead my thinking as much as possible. However, the processes advocated by Charmaz retain much of the complex coding procedure of the 'first generation' formulation of the approach. Thomas & James argue convincingly that such procedures risk 'fracturing' (2006, p. 790) the narrative, and losing much of the context and sense of what the experience was like for the participants. Nevertheless, I felt that organising the data into broad themes would help provide structure and clarity

for my analysis, and therefore I sought to develop a systematic but less restrictive approach, in line with Bryman's description of 'thematic analysis' as an approach to qualitative data analysis that:

‘unlike strategies like grounded theory or critical discourse analysis, is not an approach to analysis that has an identifiable heritage or that has been outlined in terms of a distinctive cluster of techniques.’

(Bryman, 2012, p. 578)

Throughout the process of identifying themes into which to group the interview and documentary data, I kept in mind the theories I felt to be of relevance. At this point I found it helpful to consider the distinction between a code and a theme. Charmaz's succinct definition of coding was useful in doing this:

‘Coding means categorizing segments of data with a short name that simultaneously summarizes and accounts for each piece of data. Your codes show how you select, separate, and sort data to begin an analytic accounting of them.’

(Charmaz, 2006, p. 43)

With so much data, the initial coding was challenging. I carried this out by adding an additional column to the interview transcripts and using this to allocate codes as I worked through the data (see Appendix O). Mindful of Thomas & James' (2006) critique of grounded theory approaches, I was aware that working in this way risked losing sight of the overall narrative of the interviews. However, with so many pages of transcripts, I considered that an interim coding process was necessary to ensure that every part of the interview data was taken into account in developing the themes for discussion. Additionally, by now, I had read through the transcripts a number of times (having previously carried out the interviews and transcribed them myself), and I felt



confident that I was familiar enough with the content to avoid thinking about individual parts of the interviews in too fragmented a way.

Unsurprisingly, the coding process generated a ‘proliferation of codes’ (Bryman, 2012, p. 577). During the second, more focused, phase of analysing the transcripts, I spent a lot of time examining the initial codes to identify what they had in common so as to combine them into ‘higher-order and more abstract codes’ (Bryman, 2012, p. 577). As I developed the narrative of my research, I characterised these higher order codes as ‘themes’. Bryman discusses how the distinction between a code and a theme is not clear cut and rarely spelt out:

‘... for some writers a theme is more or less the same as a code, whereas for others it transcends any one code and is built up out of groups of codes.’

(Bryman, 2012, p. 577)

Once I had identified a number of provisional themes, I returned to the initial coding and allocated each coded segment to one of the themes on a best-fit basis, or to more than one of the themes where this was appropriate. The exemplification and discussion of each theme draws on documentary and interview data relating to all nine interviewees, although in places my discussion focuses on a smaller number of participants in order to provide a meaningful level of detail to support the arguments being made. Taken as a whole, the themes aim to cover the full range of the teaching assistants’ experiences of studying the block. The aspects of these experiences that relate in particular to Lave & Wenger’s concept of legitimate peripheral participation are discussed in detail in the themes of ‘Trajectory’, ‘Status and recognition’, and ‘Learning territories’ (Sections 6.6 to 6.8). However, due to the interrelatedness of the processes involved, there is overlap between many of the themes, and all themes are

linked in some ways to the theories I have drawn on to explain the data, as well as to other important aspects of the evaluation.

### 7.3 The study process

During their interviews and in their written contributions, the interviewees made frequent references to how they approached and experienced the mathematics block as a unit of study. This first theme identifies and discusses their statements relating to the nature, content, requirements, structure and presentation of the block, although for some of these aspects the detailed analysis is woven more substantially into subsequent themes.

Two aspects of studying with the OU in a wider sense were highlighted, in particular, by interviewees as making a positive contribution. First, the flexibility possible with distance learning, in particular being able to study alongside working and managing family commitments, was put forward by four interviewees as an important ingredient in them having progressed to date with their studies. Second, the sense that the OU learning materials are of a high quality, but at the same time that the content and time demands required to study them are exacting, seems for some interviewees to have increased their determination to succeed, for example:

‘I slightly resent it for the amount of time it takes up ... but I just love it, the work is so well linked ... I tell everybody, I’m so proud to be doing it.’

(Lesley, 17/3/2014)

As both of these aspects relate to OU study more widely, I have not analysed them in detail as part of this evaluation. However, it seems valid to suggest that both may be influential in giving teaching assistants real ownership of their career related learning and development. In respect of flexibility, Becker’s (1972) model of apprentices

organising their own curriculum comes particularly to mind, in that not only have these teaching assistants organised their own learning, they have done so in a way that works well for them in their individual circumstances. Perhaps even more powerful, though, is the sense that because they see the learning as rigorous and demanding, it holds for them an even deeper value, that may help strengthen their ability to exert individual agency within their school.

In terms of the block content being presented online (with the exception of the reader), although Gina and Susan expressed a preference for ‘paper copy’ (Gina, 20/3/2014), none of the interviewees made any comments to suggest that they felt the online nature of the module was significantly detrimental to their study of the block. However, from this, it should not be assumed that the kind of challenges of studying online identified by Safford & Stinton (2016) were entirely absent, and issues concerning interviewees’ experience on the online forum in particular are discussed in Section 7.10. Three interviewees did, however, comment that they found the online presentation helpful for organising how they managed the different requirements of the block, including the element of pursuing their own interests and needs in response to their self-evaluation following the audit. Significantly, given her expressed preference for hard copy materials, Susan explained how the online interface had worked for her (including developing online study skills):

‘... once you got used to where to find things and how it flows, the content’s all down the side broken down for you, you were able to find the information ... and I also learned during the maths block that you can search for things by document at the top, which someone pointed out in the forum. So even though ... it was very daunting to start with, once you got your head round it, it’s easy.’

(Susan, 10/4/2014)

Lesley talked about how the clear structure and organisation of the block online felt reassuring and made the requirements seem manageable:

‘I always felt quite safe that everything that I needed to know for the assignment, I was going to have it by the end of it.’

(Lesley, 17/3/2014)

As well as appreciating how the materials were organised online, Tanya valued their portability:

‘... I’m quite happy sitting there on the ipad or on the laptop. I can take it wherever I’m more comfortable.’

(Tanya, 13/4/2014)

The interviews generated insufficient data on this aspect of teaching assistants’ study to support any strong claims about the contribution of the block’s online presentation of content, positive or otherwise. As suggested later in Chapter 8 in relation to students’ forum contributions, and by the issues identified by Safford & Stinton (2016) surrounding online study, the development of online study per se in relation to CPD for teaching assistants is a potential area for further research. However, from the limited evidence in this evaluation, it seems possible that for enabling teaching assistants to exercise choice and control in their learning, both important in terms of supporting them to act agentively, a clearly structured and accessible online space may, for many, be a supportive option.

Although the block’s study content and requirements are organised online, students spend a significant amount of time studying the reader (Haylock, 2010). As discussed in the previous chapter, this resource was identified by students as highly influential in their learning, and is discussed in detail in Sections 7.5 and 7.6.

For the main element of the block's assessment, students were required to complete a 'Maths Workbook' that required them to carry out or observe four mathematical activities with children in school. All nine interviewees were able to work directly with children for at least some of the activities. Four commented that they found the workbook time-consuming to complete, but all nine said that they valued the practical nature of the assignment. Four interviewees illuminated this further by explaining how the workbook tasks had directly enhanced their support of children's mathematical learning. Gina, for example, talked about:

'... researching what sort of activities to do with those [children] ... and it has helped because you selected the children that you thought would most benefit from doing those activities.'

(Gina, 20/3/2014)

In Zoë's case, her appreciation of the value of doing the assignment tasks enabled her to put into perspective her disappointment at achieving a lower grade for her written work than she had hoped for:

'... first of all I was devastated ... but there is more to it than scoring a high mark because all of this knowledge that I've learned, I'm able to apply it into my practice and make a difference to the children I'm supporting.'

(Zoë, 7/4/2014)

Whilst Zoë's response is a credit to her own resilience and professionalism, there is of course a danger that graded assignments might have a demoralising effect on students who do not achieve what they consider to be a good grade, and it is not possible to speculate on how widely replicated, if at all, Zoë's positive attitude might be. However, what does come across from the interviewees who talked in more detail about the assignment is how, as a required element of their study of the block, it opened up

opportunities for them to ‘make a difference’ in the classroom in ways they were able to initiate themselves. This strengthened their sense of being agentive within their own settings. Although school-initiated CPD, where it is offered, may similarly provide opportunities for teaching assistants to develop and try out approaches in the classroom, I suggest that there is something particularly powerful at work when these approaches are perceived (by teacher colleagues as well as teaching assistants themselves) to have been ‘brought in’ by a teaching assistant as part of their self-initiated study.

On all OU modules, students are allocated a tutor who grades and provides feedback on assignments, and also provides support through group tutorials, and on an ongoing one-to-one basis by telephone or email in response to students’ individual needs. The extent to which individual students choose to interact with their tutor can vary enormously.

Gina, for example, described how on a previous module she had attended all of the available tutorials and engaged in regular contact individually with her tutor throughout the module (20/3/2014), whereas others such as Steph (7/4/2014) and Tanya (30/7/2014) described their view of their tutor more as a reassuring presence in the background. Thus the characterisations of ‘teaching presence’ in each of Anderson & Dron’s (2012) cognitive-behaviourist and constructivist models of distance education pedagogy can perhaps be thought of as representing points at either end of a continuum.

Interestingly, all of the interviewees stated that outside of the online tutorials, they did not contact their tutor at all for one-to-one support during the block, although most stated specifically that they valued their tutor’s input during tutorials and via their own tutor group forum. As discussed later in Section 7.10, this may have been at least partly a result of the support and sense of community that they felt was available to them from their peers in their tutor group forum and in particular within the designated online mathematics forum for the whole cohort. This is not to downplay the role of OU tutors, especially in providing feedback on students’ assignments, supporting their experience

of the module as a whole, and facilitating their ongoing development of academic skills and confidence as distance learning students. However, specifically in relation to the block, very limited data on the influence of tutors were forthcoming in spite of specific questions about this being included in the second interviews. This suggests, as previously alluded to, that for these interviewees, their tutor contributed to their study as a background presence.

## 7.4 Revelation and affirmation

In my provisional identification of themes, I categorised ‘revelation’ and ‘affirmation’ separately. I settled on the term ‘revelation’ to capture the range of ways expressed by interviewees that the block had led them to think about a concept, process or aspects of their own past or present experiences in a new or different way, or even for the first time. Affirmation, in contrast, was selected to encapsulate how interviewees’ study of the block led them to feel that their existing beliefs or practices had been validated.

In some respects revelation and affirmation may be viewed as opposites. However I have amalgamated them into one theme for two reasons. First, for some interviewees, having their practice affirmed in itself involved a revelatory element. For example,

‘I would read Haylock and suddenly go “Haha, that’s why we do it like that!” I knew what to do, I knew how to do it and I knew how to explain it to the children ... but there was a lot of information in there where it suddenly went “Yes, of course that’s why we do it” and I found that really helpful.’

(Tanya, 13/4/2014)

Second, both affirmation and revelation are closely intertwined with all three 2<sup>nd</sup> order outcomes (new awareness; material and provisional; affective) in my adaptation of Harland & Kinder’s hierarchy of outcomes (see Figure 6.1), and thereby are positioned

as very influential in bringing about the key 1<sup>st</sup> level outcomes of ‘knowledge and skills’ and ‘practice confidence’. Revelation and affirmation are both closely related to ‘new awareness’, and for a number of students, both include a strong affective element, evident in the tone of Tanya’s comments above and the sense of liberation expressed by Lesley:

‘The mental maths – oh, just it felt like it had unlocked a certain area of my brain and allowed me to play around with numbers and patterns.’

(Lesley, 17/3/2014)

As discussed in Section 6.4, the remaining second level outcome, ‘material and provisionary’, came about to a large extent through interviewees’ reading of Haylock and their interaction with fellow students on the online mathematics forum. Both of these sources featured prominently in the interviewee data relevant to this theme.

All nine interviewees referred in their responses to a revelatory dimension to their study of the block. These references fell into three broad categories,

- understanding particular approaches to teaching mathematics at a conceptual level
- perception of the nature of mathematics as a subject
- appreciation of effective teaching practice

The first category was evident in the responses both of interviewees who started the block feeling confident about mathematics, such as Tanya whose response is included earlier in this section, and in those whose previous mathematical experiences had been less positive, for example Zoë:

‘I started the block feeling completely apprehensive ... I’ve still got a dread of maths ... all those years, I was literally reading, copying answers, working



through workbooks ... but now I know why that [way of carrying out a calculation] is like that. It's opened up, I wouldn't even say an olive branch, more like a vineyard.'

(Zoë, 7/4/2014)

Responses of this kind are significant. For Zoë, the feeling of having moved forward fundamentally in her understanding, and how she thinks about mathematics appears to have been magnified through reflecting back in detail on her own previous experiences as a learner. These appear to have been dominated by a rote learning approach. The influence of an individual's personal history on their learning during the block is explored further in Section 7.9. However, as with Tanya's response above, a key aspect of Zoë's reaction is that the inclusion within the block of materials written to develop subject matter knowledge (SMK), in addition to pedagogical content knowledge (PCK) (Shulman 1986), appear to have played an important role in generating the sense of revelation that seems to have been so influential in students' learning.

In terms of content, the section of the block that featured most prominently in the interviewees' comments as a source of revelation was that covering the five 'counting principles' drawing on the work of Gelman & Gallistel (1978). The nature of this revelation is noteworthy in two respects. First, it concerns an aspect of mathematics, counting, that all of the interviewees, including those professing to be less confident at mathematics, had long since mastered at a personal level and thought of as straightforward, but through their study of the block discovered it to be more complex, for example:

'With counting I thought they just learn it, but understanding how they learn will now influence how I teach them.'

(Susan, mathematics block assignment)

As well as finding this new personal ‘discovery’ enlightening, its positioning at the start of the block appears to have generated expectation amongst the interviewees that the block would open up the subject for them in exciting ways, with a resultant positive effect on how they approached their study. Second, as illustrated by Karen, five interviewees were able to draw on their new understanding relating to the counting principles immediately in their practice:

‘[The counting principles] have helped me try and identify SEN children maybe, or when I work with SEN children, to make sure that they have all those counting principles, all those five.’

(Karen, 4/8/2014)

In this respect, the teaching assistants’ learning about the counting principles also links closely to their feeling of being enabled to work with children in a much more ‘fine-grained’ way (see Section 6.3), or put another way, to teach mathematics as opposed to providing ‘support’ for children’s mathematical learning. This is discussed further in Section 7.5.

Lesley’s explanation, referred to above, about ‘being allowed’ to explore patterns and numbers hints at another type of revelatory learning experienced by some of the interviewees, that of how they perceived the nature of mathematics as a subject. In particular, the block opened up the creative possibilities of mathematics for the interviewees, for example:

‘If I had to sum up in one sentence what this block did for me – it opened my eyes further to the opportunities and possibilities for children’s learning in maths.’

(Steph, 7/4/2014)

For Gina and Amanda, the block acted more to affirm their existing views and practice in respect of creativity:

‘I am naturally a creative person, so I would turn anything creative. It was nice to read and think, yes I am doing the right thing.’

(Amanda, 9/4/2014)

As discussed in Sections 7.3 and 7.10, the interviewees imported into their practice many ideas and approaches from the module materials and contributions of other students on the forum that they considered ‘practical’ or ‘creative’. The block also included readings and activities to provide a theoretical perspective on ‘creativity’ in teaching and learning of mathematics. This content drew on the work of Craft (2010) and Clack (2010) on possibility thinking, including a video sequence that formed part of Clack’s PhD. As E207 is a level 2 undergraduate module, a strong theoretical element is required. However, it is illuminating how engaging with this particular theory brought about significant changes in how some of the interviewees thought about the nature of creativity in mathematics, and the effect this had on their practice, as exemplified by Karen:

‘I had a light bulb moment. Creativity in maths, colouring in patterns, that’s all we did and I thought that we should be doing a lot more, and when I read about those whispering moments [from Clack, 2011], and how often I hear a teacher going “shhhhhh” to the children. Because I’m right next to them, they’re just thinking out loud and now I realise how important that is, and I’ve spoken to my teacher about that too ... it was just recognising that creativity doesn’t have to be like those big projects ... it’s about talking’.

(Karen, 23/3/2104)

For Hannah, who described herself as confident at mathematics, an influential aspect of her revelatory learning was the appreciation that mathematical ideas are often not easily grasped by children, accompanied by developing an awareness of teaching approaches to help develop understanding:

‘... even terms that I thought were quite simple ... ten, eleven year old children still not understanding halving. In my head it’s like dividing by two, but through the maths block I was able to pinpoint actually maybe they need to do it visually, how can I do this? And strategically placed dots on a piece of paper, giant dots on a giant piece of paper and folding the paper in half ... it’s so simple but if I hadn’t have done the maths block I definitely wouldn’t have thought about it.’

(Hannah, 16/3/2014)

It is not clear from the interview transcript whether the halving activity itself formed a part of Hannah’s work-based study, but it does seem evident that the emphasis within the block on teaching for understanding, and the important role within this of practical activities and mental imagery, has led her to begin to develop her thinking about mathematical learning beyond her own previous experience as a learner, thus enhancing her practice.

## 7.5 Being equipped

The powerful affective element of revelation and affirmation is also evident in how six of the interviewees referred to the way the block enabled them to feel better equipped to work with children on mathematics activities. ‘Being equipped’ is a theme that was strongly in evidence throughout the responses of all nine interviewees. It is illustrated

well by the counter example of Lesley's description of how it feels for her not to be equipped:

'It's imperative that I understand the concepts being taught and I support, otherwise I just don't feel equipped to support the students. And that feeling of supporting children on something and not being completely sure is overwhelmingly horrible.'

(Lesley, 6/8/2014)

The distinction made by Lesley between what is 'being taught' by the teacher and her own 'support' of this might be interpreted as meaning that the teaching is in some way incomplete. Importantly, though, as Lesley implies, in order to provide effective 'support' it is necessary to have the same level of understanding as the teacher. Therefore I suggest that placing teaching assistants in the position, as seems to have happened on occasions to Lesley, of feeling out of their depth through not possessing this 'teaching' level of understanding, is not acceptable. As Devecchi & Rouse concluded, whilst effective collaboration between teachers and teaching assistants requires roles and responsibilities to be clearly defined, it also 'may require challenging traditional lines of professional demarcation' (2010, p. 91), in this case relating to what is understood by 'teaching' and 'support', and, indeed, whether there is any material difference.

It seems clear that the new awareness and depth of understanding discussed in the previous theme played a significant role in developing the teaching assistants' sense of being equipped; the emphasis within this theme is more on the specific ways in which this sense of preparedness to 'support' children's learning in the classroom is reified in their practice.

A significant factor in feeling equipped, expressed by seven of the nine interviewees, was being able to draw on the mathematics reader (Haylock, 2010) as a reference source, for two key purposes. First, they reported using it to ensure that their own understanding of mathematical concepts and methods was secure and, second, to learn about effective approaches for their own practice. Interviewees also identified their peers' contributions on the forum as a valuable source for practical ideas; this is explored in detail in Section 7.10. Karen's appreciation of the reader in providing her with the necessary subject knowledge focused on its authenticity and accessibility:

'It was just easy to understand. If I had a problem with maths, the answer was right there, right on the page ... it's obviously been written by somebody who really understands maths.'

(Karen, 4/8/2014)

Steph found the reader 'quite hard going' but nevertheless reported that the book:

'... comes with me to school, and I have referred to it on a couple of occasions so [it] has now become like a little reference book.'

(Steph, 6/8/2014)

This ongoing use of the reader as a valued reference source came across from the interviewees as important, not just in providing a sense of security in respect of their own SMK and PCK (Shulman, 1986), but also in strengthening their individual agency by making them feel more able to offer suggestions in the classroom, and their status within the school more widely. These matters are explored in Section 7.8 within the theme of 'status and recognition'.

Throughout the block there is a strong emphasis on the need for practitioners to develop a secure grasp of mathematical vocabulary and to model its use accurately when

working with children. The responses of five interviewees in particular point to a strong empowering effect in being able to use mathematical terminology with confidence and accuracy. For example, Amanda referred to her use of ‘technical maths words’ and ‘technical language’ (31/7/2014) and Hannah, who described herself as a confident mathematician, reported that she ‘felt a bit stretched by the new words, like the different terms for describing the calculation methods’ (11/8/2014). Lesley, who started the block very apprehensively, spoke about how it felt:

‘... brilliant being able to comment exactly what [a pupil she was supporting] can and can’t do, using the proper language.’

(Lesley, 6/8/2014)

All three examples convey an enhanced sense of professionalism, achieved through being able to speak the ‘technical’ or ‘proper’ language of mathematics authoritatively. As well as being an important part of feeling equipped, this had a wider effect on how the interviewees perceived their own status as mathematicians. It is also of note that this enhanced professionalism emanated from these teaching assistants’ study of the block, and not from the school-based ‘old timers’ in the models of ‘trajectory’ suggested by Lave & Wenger (1991).

The influence of the block in enabling teaching assistants to work with children in a much more fine-grained way was discussed in Chapter 6. This finding featured strongly in the interview data, with six interviewees referring at least once to the block having enabled them to identify specifically what a child or group of children had not understood or ‘what they didn’t know, where the gaps were, why they were struggling’ (Karen, 4/8/2014). When talking about this aspect of their learning, the interviewees referred in particular to the five ‘counting principles’ (Gelman & Gallistel, 1978):

‘I’ve always wondered how we ever started with maths, so it actually helped me work out back to basics. We have children, some of them with special needs, that are so low, they don’t actually really have those principles, so I found them extremely interesting and helpful.’

(Tanya, 30/7/2014)

Echoing the discussion in the previous section, there seems to be a significant empowering process at work when teaching assistants are given opportunities to engage in depth with theoretical ideas relevant to their practice.

## 7.6 Confidence

Increased confidence was identified in Section 6.4 as an important outcome of teaching assistants’ study of the block, and I established the term ‘practice confidence’ as a 1<sup>st</sup> order outcome in my adaptation of Harland and Kinder’s hierarchy. Although seemingly highly significant, ‘Confidence’ is difficult to separate out from some of the other themes, mainly because confidence is usually related to doing or saying things in certain situations. It is connected with ‘Being equipped’ in particular, since the teaching assistants’ increased confidence, as conveyed in their responses, emanated largely from outcomes such as their greater depth of understanding of mathematical ideas and their ability to use technical vocabulary accurately. In asking the interviewees to explain what they meant when talking about feeling more confident, their responses fell into three main categories.

First, four interviewees stated explicitly that feeling better equipped had enabled them to present a more confident persona in the classroom. Tanya explained how she felt this enhanced her practice and the children’s learning,



‘I’m much calmer, and if they can’t get it one way, it’s taught me to come at them from a different angle. So they are also calmer and more open to working with me.’

(Tanya, 30/7/2104)

Although careful not to categorically attribute the improvement in a particular boy’s confidence and learning to her study, Steph felt that a contributing factor may have been her own deeper understanding, which had increased her confidence and enabled her to:

‘...try and make it a bit more fun, so that they can see it’s not just about learning numbers, it can be fun.’

(Steph, 6/8/2014)

There are echoes here with the discussion in Section 6.3 about teaching assistants achieving a ‘productive balance between nurture and progressing a planned learning activity’ (Hancock, 2013, p.301), and an indication that developing secure subject knowledge may not only be an important part of achieving this balance, but also a contributing factor to building the kind of rapport with children that helps teaching assistants to develop the pastoral elements of their pedagogy.

The second way in which teaching assistants’ increased confidence played out, already introduced in Sections 6.4 and 7.5, was in enabling them to be much more finely attuned in their assessment of children’s mathematical learning, for example:

‘[Confidence] is being able to tell the difference between whether they’re making a silly mistake or if it’s a misconception. That’s really important because if you dismiss the misconception ... they haven’t got to the bottom of what the teacher is showing them and then they won’t be able to use that to help solve problems independently.’

(Karen, 4/8/2016)

For six interviewees, this extended to feeling able to make adjustments on their own initiative part way through an activity when they felt this was necessary. For example, resonating with my assertions about teaching assistants moving from ‘supporting’ into teaching, Tanya stated that as a result of the block she was more able to:

‘... see things ad hoc. To go ‘do you know what, I know that [the teacher] said to do this, but it’s not working’. And to be able to have the confidence to the go ‘I’m going to do this’. Then say the end of the lesson ‘It wasn’t working so I did that’. And the teacher is then happy that we haven’t wasted that time.’

(Tanya, 30/7/2014)

Clearly, for this to happen, a productive and trusting relationship needs to have developed between teaching assistant and teacher, as seems to have been the case with Tanya. Nevertheless, in terms of helping these teaching assistants to develop agency, in this case reified through feeling comfortable to take decisions independently mid-activity, their increased practice confidence, as developed through their study, also appears to have been a significant factor.

Third, the teaching assistants’ increased confidence manifested itself in a greater willingness to contribute to lesson planning, or to approach teaching colleagues with suggestions. Eight of the interviewees made comments to this effect, perhaps best exemplified by Zoë:

‘So now I will be able to speak to the teacher ... and ask if I was able to take [a particular child] next door, and just work with place value with her, just multiplying by ten firstly ... so that she could see that the digits are moving ... with a place value chart.’

Zoë's confident and accurate use of mathematical technology here was mirrored by a number of interviewees when they talked about making suggestions to teachers. This again illustrates the powerful effect of feeling equipped on the confidence and ability of these teaching assistants to exercise personal agency in their setting, in this instance being able to use terminology securely with the realisation that previously they would not have been able to do so. Willingness and the ability to play a greater part in decision making are also closely tied in with issues relating to status and recognition, which are explored in Section 7.8.

## 7.7 Trajectory

The themes of 'trajectory', 'status and recognition' and 'learning territories', discussed in this and the subsequent two sections, are particularly closely intertwined. Starting with 'trajectory', I will focus in particular on two interviewees, Zoë and Karen, to illustrate its interaction with the outcomes of teaching assistants' study of the block. These are two teaching assistants whose career aspirations and the level of recognition and support for their study that they experienced in their workplace contrast significantly.

Zoë describes a clear hierarchy in her school, but one within which the contribution of teaching assistants is valued highly, with structures and procedures in place for them to make a meaningful contribution to practice:

‘There is definitely a hierarchy between teachers, between management, senior management, teachers, TAs ... but we are recognised as an invaluable part, we have a weekly TA meeting, the deputy head, who is our line manager, is also

there alongside the SENCO and they always stress how invaluable we are in the children's learning and development.'

(Zoë, 31/7/2014)

Given the hierarchy that she describes, Zoë's trajectory might on first examination be seen as peripheral in that it will:

'... never lead to full participation ... yet may well provide a kind of access to a community and its practice that becomes significant enough to contribute to one's identity.'

(Wenger, 1999, p. 15)

However, at the same time, it is possible to see Zoë as considering herself to be on an inbound trajectory towards full participation in the wider community of qualified teachers, although it is important to acknowledge that such intentions might not necessarily be supported or encouraged by all schools. Zoë, along with other interviewees, talked about how her school's awareness of her aspiration to qualify as a teacher has led to her being perceived differently with a resultant effect on what she is 'allowed' to contribute. Tanya provided some additional thoughts on this effect:

'... a lot of the teachers, knowing that I want to continue my study and become a teacher ... treat me a lot more like [one of the teaching assistants who is a qualified teacher] than they do the other TAs ... they feel that we care more because we want to be teachers.'

(Tanya, 30/7/2014)

For a teaching assistant, this wider community of qualified teachers might appear rather intangible, with the possibility of full participation in it some way off. However for Zoë,

it perhaps feels more within reach, as she hopes to eventually follow an employment based route into teaching within her current school, and that her OU study has:

‘... opened many doors, I don’t think I would have got my job if it hadn’t been for the fact that I am studying, and the fact that I’m studying in my school, they do the train to teach thing ... so I’m first in the queue because while I work there I will have my degree.’

(Zoë, 7/4/2014)

Unlike Zoë, Karen has no aspiration to become a teacher. As I have stated previously, Karen reported that in terms of professional development, teaching assistants in her school were ‘left to get on with it’ (4/8/2014). Nevertheless, from the passion and enthusiasm with which Karen talks about her work it is evident that she feels sufficiently a part of her school community for it to contribute in a positive way to her identity. However, by a combination of personal choice and the school’s approach to support staff, her participation appears to resonate fairly closely with Wenger’s characterisation of a peripheral trajectory.

In reality, though, Karen’s trajectory is more nuanced in the way that her own practice is positioned, and ‘peripheral trajectory’ should be considered as a ‘best fit’ description for two reasons. First, Karen has developed an effective professional relationship with the teacher she works alongside regularly in mathematics lessons, in which she feels confident to say:

‘... can I take that group out and we’ll start again at the beginning? And my teacher is really good, she’ll say ‘yes, off you go!’

(Karen, 23/3/2014)

Karen attributes this way of working directly to her study of the block:

‘... without doing the OU ... we wouldn’t have been able to have the small groups, we wouldn’t have been able to have the maths discussions.’

(Karen, 4/8/2104)

Second, in addition to working closely with one class teacher, Karen has an additional role supporting children with English as an additional language (EAL) across the school. Karen states that ‘a lot of focus does go on maths with EAL children’ and also that because of the autonomy she enjoys within this additional role, her learning from the block has been especially influential:

‘[working with the children with EAL] is my baby so I can influence that.’

[Karen, 4/8/2014]

Karen’s form of practice therefore appears comparable to that of the teaching assistants in Graves’ (2013) research, in that it is individual and peripheral at least in part by choice. Within her EAL work, however, I suggest that the expertise she has developed may qualify her for the role of ‘old timer’ in relation to that area of specialised practice. Based on Karen’s account of how her study of the block has interacted with and enhanced her practice, such an individual trajectory appears to offer much in terms of teaching assistants being able to learn productively, and in developing their contribution to teaching and learning within their school in alignment with their own strengths and interests.

With the examples of Zoë and Karen in mind, it is worthwhile revisiting the research cited by Howes (2003) that positioned teaching assistants as working outside a school’s structures and formalities. In comparison, Zoë’s roles and responsibilities (as well as those of other interviewees in this evaluation) appear to be incorporated much more securely into the structures and processes of her school than in Howes’ research, and

acknowledged by the school as valuable and effective. This can be considered a significant change of role over time if replicated more widely across the UK.

Karen's school, in contrast, is perhaps an example of a setting where the deployment and provision for professional development of teaching assistants has remained less well defined. Nevertheless, my data suggest that Karen's participation can be considered as constituting 'extremely important work' (Howes, 2003, p. 150). However, the positive outcomes from Karen's study seem largely attributable to her own motivation and actions, in particular her decision to study at the OU. It is important to recognise that, as with Zoë, much of the work Karen describes herself as carrying out constitutes 'core' work undertaken as part of a classroom team, in which teaching assistants have different kinds of experiences and qualifications to teachers, but nevertheless can be considered as contributing to teaching, as opposed to the less influential term 'supporting learning'. In Karen's case, though, this seems to be more akin to working in the 'spaces left' (Howes, 2003, p. 150). This contrasts with Zoë's school, in which structures to fill many of these spaces appear to have been developed in a way that both recognises and enables what individual teaching assistants have to offer to be utilised more effectively.

The examples of Zoë and Karen add weight to the suggestion made in Chapter 2, that Lave & Wenger's original view of participation described by Fuller as 'that experienced by legitimate peripheral participants engaged on an 'inbound' journey from new-comer to old-timer in a community of practice' (2007, p. 25) would require further development to be able to explain adequately the workplace learning of teaching assistants. Common to all of the models of apprenticeship presented by Lave & Wenger is the journey from new-comer to old-timer. Therefore for Karen's workplace practice and learning, an apprenticeship metaphor seems only partly applicable since it seems she will not ultimately take on a 'full' teaching role, although this in itself is debatable

in relation to her work with children with EAL as already discussed. Comparison to an apprenticeship certainly appears more applicable for the trajectory being travelled by Zoë and the other interviewees aspiring to become teachers, especially given ‘the varied character of concrete realizations of apprenticeship’ (Lave & Wenger 1992, p. 65).

However it is important to emphasise that, as discussed in Chapter 2, their journey from new-comer to old-timer is less clear cut, and deviates for a considerable length of time via the role of a teaching assistant. Some of the complexities regarding status and recognition that stem from this are explored in Section 7.8.

On the basis that an apprenticeship analogy seems relevant, at least to some extent and in varying degrees, to the teaching assistants in this evaluation, it is worth reflecting back on my speculation in Chapter 2 that, of the examples explored by Lave & Wenger (1991), the meat cutters in U.S. supermarkets may be most similar to the position of the teaching assistants in this study in that the butchers’ apprenticeship combined attendance at trade school with workplace training.

For my interviewees, it seems that their study of the block was not characterised by a lack of currency similar to that experienced by the meat cutters. This is consistent with the findings of Edmond’s (2010) study of teaching assistants on a foundation degree. In fact, the opposite was often the case with my interviewees’ responses, which reported that their learning on the block provided a springboard for them to make suggestions and introduce resources and teaching approaches, as discussed in the previous section. For this to occur, though, the relevance and currency of the teaching (the module materials in the case of the block) is of central importance. In this respect, the requirements of the block for students to carry out tasks in their school practice might be seen as a valuable litmus test for the appropriateness of the content of the block.

However, given the current emphasis within UK primary schools on nationally administered end of age phase testing, there is also the danger that the block’s emphasis



on teaching for understanding may, for example, be at odds with approaches to teaching mathematics in some schools. However, this was not raised as an issue by any of the nine interviewees, but this cannot be taken as meaning the same would be true for all students studying the block.

Although arguably not fully apprentices in the sense of any of Lave & Wenger's examples, the teaching assistants in my evaluation acted in ways that do chime with Becker's (1972) view of apprentices organising their own learning. They can justifiably be seen as learners on trajectories with similarities to those of some apprentices, and they have taken a significant degree of responsibility for organising their own learning and 'curriculum', including investing much in terms of time and finance. That they report having been successful to date in their learning may be related to the way in which taking responsibility in this way has given them a sense of ownership of their own learning and intended career paths.

## 7.8 Status and recognition

The process of assigning segments of data to themes resulted in 'status and recognition' taking shape as the most populated theme. It is important to note, however, as discussed in relation to Karen in the previous section, that a lower level of status afforded to the professional development and self-initiated study of teaching assistants at an institutional level does not, necessarily, restrict the learning and development of practice of an individual if personal motivation is strong and productive relationships are in place at a more micro level (typically, within a classroom team).

However, the interview data point to a strong relationship between the reported positive effect of teaching assistants' study of the block (and their OU study more widely) on their status and recognition within their schools, and the successful outcomes they describe relating to their practice and its effect on children's learning and behaviour.

Hannah reported that recognition of the potential contribution of teaching assistants was less evident in her school, and stated that she had found it difficult to fashion opportunities to draw on her block learning in her classroom practice, and with some teachers more so than others:

‘There are a few teachers who have been there over twenty years, who find it difficult to work with teaching assistants.’

(Hannah, 11/8/2014)

For these interviewees, however, such an experience was the exception. They frequently reported that schools took them more seriously as a result of their study. One example of this (Amanda, 31/7/2014) was discussed in Section 6.4. Amanda explained how being taken more seriously brought about a significant change in both the quantity and quality of her interaction with teachers:

‘I think they took me more seriously because they realised I wanted to learn, I wanted to know ... they would find the time to sit down, a couple of them said – look I haven’t got the time now, but if you want I can spend 15 minutes with you after school and we’ll go through it.’

(Amanda, 31/7/2014)

Zoë provided an additional perspective on this point, linking her wider OU study to the perception that she was now trusted to a greater extent by teaching staff:

‘They trust me now ... I don’t think it’s just down to the maths block, but it’s the whole, she’s studying a degree, she’s picking up this, she’s learning that, she’s a useful TA to have.’

(Zoë, 7/4/2014)

In Gina's case, being taken more seriously resulted in her being given greater teaching responsibilities for mathematics in her role as an HLTA:

‘... where we had a few people off or on courses on quite a regular basis, I was called on to take a maths set.’

(Gina, 4/8/2014)

Steph explained how she has been able to use her study to, in effect, provide a professional mandate for her suggestions, enabling them to be agreed to by teachers:

‘I think I did pester quite a few teachers actually to come in and say - I've got this idea, it's from the Open University.’

(Steph, 7/4/2014)

Each of these examples reinforce Becker's (1972) views about the value of apprentices organising their own curriculum, and further that many of these teaching assistants' schools appear to have highly regarded the learning arising from this. Even if the trajectory of these teaching assistants might only be considered comparable to that of an apprentice to limited and varying extents, these examples suggest persuasively that self-initiated engagement in study and professional development can add value to their workplace performance and effectiveness. This seems especially so when their school, and in particular the colleagues they work with closely, respond positively to the products of their study.

Differences in how teaching assistants are viewed by teachers were alluded to by a number of interviewees. For example, Lesley talked about how she is regarded differently by some teachers because of her study, and that as a result ‘we often have discussions together, two or three teachers and myself’, but that such a collegial approach is not universal within the school:

‘I’m still considered a TA but hugely valued, but there are other teachers that only share what they need to share ... there’s no discussion or understanding on exactly what they want the child to get. Different teachers have different ideals on what the TA should be.’

(Lesley, 6/8/2015)

Based on the interview data, it seems reasonable to speculate that some of the ‘other teachers’ described by Lesley may have been won around to work more collegially if they had had the opportunity to support E207 students with their work-based learning. This might have led them to appreciate the potential benefits to them as teachers, and to their pupils, of a more team-oriented approach to teaching mathematics (and indeed other subjects). However, the data suggest that in some schools, at least, further development work is required in terms of incorporating teaching assistants into effective teaching teams.

There is an echo in the interview data of the reluctance of some of the schools in Woodgate-Jones’ (2012) study to engage with students teachers as ‘skilled newcomers’. It does appear, though, that as speculated in Chapter 2, for the most part, the ability of the teaching assistants in this evaluation to act as ‘skilled newcomers’ was much greater than in Woodgate-Jones’ research. This was seemingly because in one sense they were not newcomers at all, having already established a presence and a role for themselves in their settings. Therefore, where their study had led them to be perceived differently and listened to more by their school colleagues, they may have been responded to as possessing many of the benefits of being ‘skilled newcomers’, but with the crucial addition of already having gained their schools’ respect and trust as practitioners.

## 7.9 Learning territories

A key idea to emerge from the initial study and the questionnaire data was the interaction between teaching assistants' learning during the block and their wider life experiences. Drawing on Hamilton's metaphor of teaching as refraction (cited in Stenhouse 1975), it was hypothesised in Section 2.3 that, for the block, refraction may occur as a result of the way in which individual students' learning territories (and how they respond to them) interact with and influence their engagement with the block. The following five learning territories, comprising E207 students' learning milieu, were set out in figure 2.2:

- the E207 module materials and activities
- engagement in online tutorials and discussion forums
- the workplace
- home and the wider community
- personal history

The first three of these territories are explored in depth elsewhere in this chapter.

Discussion in this section focuses on the territories of home and the wider community and students' personal histories.

In the initial study (see Chapter 4), the potential influence of students' engagement with their home and wider community emerged as a central theme in the interview with Emma. For example, she described that as well as giving her greater confidence in her own mathematical knowledge and classroom practice, her study of the block also resulted in positive outcomes relating to her professional identity as being knowledgeable about children's learning beyond the school context:

‘I work part time in a bank as well ... the people I work with who’ve got children of primary school age, I’ve copied pages from [Haylock] for them to use with their own children... when they’ve said to me “do you know about chunking, or the bus stop method, or do you know about this or that?” I’ve been able to say “actually yes I do, this is what it refers to, this is how you’d use it”.’

(Emma, 10/2/2013)

There is a two-way effect here in how a student’s wider experience can contribute to their learning during the block and, indeed, how their learning from the block might feed back into and interact with these wider individual contexts.

However, although the interviewees were asked specifically about outcomes at home or in their wider community resulting from their study, their responses indicated that these territories may have been less influential for this group of interviewees overall than I had anticipated. Only two, Lesley and Zoë, related their learning at any length to their wider context. It may be significant that of the nine interviewees, these two had started the block as reportedly the least confident in their mathematical ability, and with negative feelings towards mathematics resulting from their experiences of the subject as learners at school (also the case with Emma). This suggests that for the other interviewees, although the block for the most part resulted in positive outcomes in terms of their practice, it was less transformative in relation to how they felt about themselves as mathematicians, and therefore less influential at a personal level.

The notion of the block feeling like a safe place to learn was introduced in Section 7.3 and, for Lesley in particular, this sense of safety, which went beyond feeling comfortable with how the block was structured and presented, was an important enabling factor in her feeling that her study of the block had been successful. She made a telling comment that the block had ‘allowed me to play around with numbers and

patterns' and that doing so had made her 'a lot more confident in explaining [mental mathematics] to my daughter' (17/3/2014). This suggests a sense of liberation from previously having been constrained by the subject. In Lesley's case this constraint may have stemmed not just from her experience of mathematics as a rigid area of study in which, as a learner, her answers were more often wrong than right, but also as a stumbling block to her effectiveness at work and her career aspirations:

'I retook my GCSE maths at school three times, and I only ever got a D, and I sort of gave up after that ... I wanted to go further in schools particularly, but the thought of supporting a maths lesson where I didn't feel confident was holding me back ... I needed to do something.'

(Lesley, 17/3/2014)

Having triggered such a dramatic turnaround in both her attitude towards mathematics and confidence in her mathematical ability, Lesley's study of the block appears to have generated an almost evangelical zeal for sharing the results of her learning:

'I'm effervescent with my enthusiasm, and I can't sometimes allow myself to be quiet. People sometimes don't want to know about the relationship between fractions ... but my daughter's teacher is really interested, and we often have conversations about what I'm learning ... or I go in with websites for her and she's bought things online I've told her about through learning on this course.'

(Lesley, 17/3/2014)

If Lesley's account is considered in relation to the five learning territories set out in Figure 2.1, 'personal history' stands out as perhaps the most likely to present a troublesome filter to successful outcomes. Therefore it seems worthwhile to speculate as to why this did not transpire. First, as already discussed in relation to my adaptation of Harland & Kinder's hierarchy of outcomes, most E207 students approach their study

highly motivated to succeed (for Lesley, based on her desire to feel more secure in her work with children in mathematics lessons, and to progress her career). The power of this motivation to overcome potential barriers to achievement should not be underestimated. However, the nature of the interaction between Lesley's personal history and the other learning territories also seems significant.

In terms of the module content, the block includes explicit discussion of how and why many adults lack confidence in and experience anxiety about mathematics, and approaches this issue in a positive and supportive way. Additionally, as discussed in Sections 7.3 and 7.10, the online mathematics forum appears to have been effective in providing opportunities for teaching assistants with negative prior experiences of mathematics to share their feelings with others possessing similar anxieties, and to support and encourage each other. For Lesley this appears to have been a crucial enabling factor for her learning:

‘A few people, myself included, a couple of times said – I’ve got no idea what this means! Just hearing that other people didn’t know what it meant was helpful, you know, sharing that ...’

(Lesley, 17/3/2014)

For Lesley, her workplace being an enabling environment was another important factor in her successful study of the block. She talked about the value of:

‘... having a mentor who’s read through everything that I’ve written, she’s more confident in giving me more responsibility.’

(Lesley, 17/3/2104)

There is a close echo here with Swann and Loxley's research, which found that some of the assistants' schools would 'gradually increase the scope of their responsibilities as



competence grows' (1998, p. 157). However, Swann and Loxley also found that this was not the case for many of the students in their research. Therefore, based on the evidence from the interview and questionnaire data in this evaluation, I tentatively suggest that there may have been a considerable shift in the two decades since Swann and Loxley's work in the willingness of some schools to embrace, support and draw on the self-initiated study of teaching assistants.

In this response, Lesley makes reference to the supportive contribution of her mentor who, in common with many E207 students, was the class teacher she works most closely with, although for some students their mentor was the head or deputy head teacher. The role of school-based mentor on E207 is to act as a facilitator, and provide encouragement, support and feedback on the school-based elements of the module. As such, it is an influential role, and one that most students deeply appreciate. Therefore it is interesting that, notwithstanding Lesley's comments (and those reported elsewhere from Karen and Gina), limited data about the contribution of mentors were forthcoming from the interviewees. It is not possible to state with any conviction why this might have happened. However, it can be speculated that because these teaching assistants also required a mentor for their previous module, they may have already built up a productive mentor-mentee relationship, and the arrangement therefore felt less of a distinctive feature of their study on the block. If this was the case, however, it might also have been the case that having a positive, well-established relationship already in place was a contributing factor in providing interviewees with the confidence to make suggestions for practice.

In addition to her engagement with her daughter's teacher, discussed above, Lesley also reported how mathematics has become an active and positive element of her identity more widely in her everyday life:

‘I’m more confident with maths generally, I discuss maths more at home with my daughter and partner. I’m able to talk about things in a different way ... I talk about the success of my module as in how much I’ve learnt with lots of people at work ... I think it makes other people think oh, you know, I might go and do my adult numeracy because I’m saying to people you can do it, give it another go, and I can help you if you get stuck.’

(Lesley, 6/8/2014)

The final sentence here in particular illustrates how a personal history that might on first consideration seem to be a troublesome learning territory, can potentially act to enhance and add impetus to learning. Additionally, Lesley’s example suggests that for students with similarly difficult personal histories in terms of mathematics, interaction with their home and wider community has the potential to enrich their learning further.

However, it would be wrong to conclude that studying the block will bring about a similarly positive transformation in all cases. As reported earlier, none of the nine interviewees stated that their overall experience of the block was negative.

Nevertheless, although similarly anxious about mathematics at the outset, Zoë’s responses to aspects of the block were quite different from Lesley’s. As mentioned in Section 7.4, Zoë, like Lesley, experienced difficulties in her mathematical learning at school. As she studied the block, Zoë found it hard to see beyond her existing view of mathematics as a subject of ‘right and wrong’ and consequently she perceived the mathematics audit as a test and found it ‘hideous’ because, although she was able to work out many of the answers, she found it much harder to explain them. Zoë felt that:

‘... the block took me out of my comfort zone, but that’s the whole idea of learning ... and it’s for me as a student teacher to know how I’m going to work

this out to work for me, to support me and my learning and the children that I am supporting.’

(Zoë, 31/7/2104)

Although, as previously discussed, Zoë’s study of the block enabled her to improve her mathematical knowledge and understanding and draw on this to develop her practice, these comments suggest that her underlying anxieties about mathematics may still be in place. It seems that the successful outcomes resulting from her study owe a lot to her determination as an adult to overcome her fears and discomfort in order to achieve her very clear goals.

An interesting finding to emerge from the data was how a positive personal history in relation to mathematics might represent a potential barrier to a teaching assistant’s learning on the block. In contrast to Lesley and Zoë, Tanya approached the block confident about her own mathematical ability, which had an effect on her expectations:

‘Because I thought I’m really good at maths, there’s only a couple of areas I’m not very good at, I didn’t think I would get an awful lot out of it ... I thought this is going to be quite easy.’

(Tanya, 30/4/2014)

The danger in such an approach is that a teaching assistant might fail to engage with key ideas presented in the block, for example the importance of teaching for understanding and making children’s experiences of mathematics in the classroom meaningful.

However for Tanya, this was not what happened:

‘I was quite surprised at the end ... about what I had learnt. I actually thought – I can’t get all this in my assignment, there’s just too much.’

(Tanya, 30/4/2014)

From Tanya's interview data, two aspects of the block in particular appear to have helped make it a productive learning experience for her. Firstly, she experienced strongly the effects of affirmation and revelation discussed in subsection 7.4, in particular from her reading of the module reader:

‘The book was amazing ... there was a lot of information in there where I suddenly went – yes of course that’s why we do it – and I found that really helpful ... a lot of stuff that links to everyday life ... I found that really helpful with children.’

(Tanya, 30/4/2014)

The authoritativeness of Haylock (2010) as a text for ‘primary teachers’ (i.e. not a differentiated, more ‘lightweight’, resource for teaching assistants) seems important. Within the book, mathematical ideas are explained and exemplified thoroughly, and this appears to have been an enabling feature for interviewees who started the block feeling confident as well as those who approached it apprehensively.

Secondly, for Tanya, the block provided her with meaningful opportunities to engage in discussion and develop her relationships with other colleagues within her school, for example:

‘It gave me a way in with my maths coordinator, who I’d thought was quite scary. And I actually found she’s not. She loves talking maths, so when you say “Have you got a minute?” she’ll always happily stop and talk through something and bounce and share ideas ... it’s given me that confidence to talk to her and a reason to talk to her ... the confidence now to ask her questions or for help.’

(Tanya, 30/4/2014)

Significantly, although Tanya's personal history contributed to her confident approach to studying the block, in another learning territory, her workplace, she experienced apprehension, at least in terms of her relationships with some colleagues. The contrast between Tanya's levels of self-assurance in different contexts exemplifies the complex nature of teaching assistants' trajectories, and how their individual learning territories can interact to influence the success or otherwise of a study experience such as the block.

### 7.10 E207 as a community of practice?

As part of my adaptation of Harland & Kinder's hierarchy in Section 6.4, the web-based and physical resources that teaching assistants learned about from fellow students on the online forum were considered to form part of the material outcomes of studying the block, and identified as influential in strengthening students' knowledge, skills and practice confidence. In Chapter 2, it was suggested that the mathematics forum and the other online groups that students belong to might be more accurately thought of as 'communities for thinking about theory and practice'. However, in light of the value attached by these teaching assistants to the contributions of their peers relating to 'material' outcomes during the block, this community might be seen as extending beyond thinking about theory and practice to also include sharing ideas and supporting each other's practice and learning. Amanda's comment about this was typical of many:

'... there were so many little bits you could pick up from different people's settings and "have you tried this angle? I did money last week and we introduced this and we did this?" So many different ideas and concepts that came in that you just got your imagination going, thinking "I could take that but move it from, say, money into shape or, you know, just slightly tweak it".'

(Amanda, 9/4/2014)

The first of Wenger's dimensions necessary for the coherence of a community of practice is mutual engagement, characterised by 'being included in what matters' (1999, p. 74), and for these interviewees what seems to have mattered in particular was the opportunity to read about the practice and experiences of others and reflect on these in relation to their own:

'... people being able to be confident and say "actually I'm not 100% sure about that, we do it slightly differently in our school". It's nice to see that people are doing things differently, but at the same time if you utilise the ideas that they're using, you can draw on that.'

(Steph, 7/4/2014)

Many of the requests for, and sharing of, ideas related to the topics covered in the workbook tasks, and this appears to have contributed in particular to the interviewees' high level of appreciation of the peer support available on the forum. Finding out about the practice of others seems to have not only been illuminating for the interviewees in thinking about their own practice, but was also valued because it supported them in thinking about and preparing for their own assignment. As a result, the sense of these contributions constituting 'what matters' may have been heightened.

A phrase by Tanya, 'there was so much buzz coming off there' (13/4/2014) captured the energy and motivational effect that most of the interviewees seem to have experienced through their engagement with the forum, and for Amanda being drawn into this community seems to have been particularly significant:

'I've never used the forums like I've used them this year and I will be using them in the future a lot more ... it just makes you stop feeling so alone and isolated.'

(Amanda, 9/4/2014)

Although there is a risk of reading too much into Tanya's use of the word 'buzz' and other interviewees' enthusiastic comments about the forum, it seems reasonable to suggest that these responses may indicate the presence of at least some of the 'aspects of informal contact' considered by Jewson (2007, p. 158) as important for engendering a sense of community, but harder to achieve through online communication.

The isolation referred to by Amanda appears to relate to her experience as a student, and suggests that much of her prior experience of OU study may have corresponded to Anderson and Dron's (2012) cognitive-behaviourist model in terms of the level of social presence. In a practice context, as part of a team of teaching assistants within a school, most individual teaching assistants may not feel isolated to such an extent.

However, there is a strong sense from the interviewees' responses that they valued and benefitted from feeling part of a wider group of colleagues, in effect a subset of the teaching assistant workforce within the UK. That this was achieved as part of an online network, suggests that looking to extend the development of networks or clusters of teaching assistants linked to their CPD, either locally or across wider geographical areas may be a positive and effective way to enhance the practice of the wider teaching assistant workforce. However, in light of my contention that the rich interaction on the E207 mathematics forum appears to have been at least partly driven by the contributors' study demands, careful thought would need to be given to how any such networks are structured and managed, in order to ensure that establishing them is worthwhile.

Eight of the interviewees participated actively in the forum, to varying degrees. Hannah, however, stated that she lacked confidence to contribute, but that she had read all of the posts, and used ideas for activities in her practice (16/3/2014), thereby still benefitting from the forum in terms of material outcomes, and also potentially by beginning to feel part of a wider group of teaching assistants.

The interviews did not reveal any particular issues relating to Jewson's discussion of 'real time/space contexts for virtual encounters' (2007, p. 161), although two interviewees commented that they felt daunted by the number of posts, and in response restricted how often they accessed the forum, and chose to read only threads that they were particularly interested in. As such they were able to benefit from the forum as a resource, but perhaps without developing the same sense of community membership described by some of the other interviewees. Of note, though, is that a significant minority of questionnaire respondents, nearly one fifth, did not share the positive view of the forum conveyed by the interviewees. Due to the make up of the group of interviewees, however, the interview data were unable to uncover what was behind these views.

Returning to Wenger's concept of joint enterprise, the need for participants in a 'community for thinking about theory and practice' to negotiate 'real and liveable relationships' (1999, p. 79) and develop mutual accountability seems to have been important, even though probably to a lesser extent than in a physical workplace, as the following remark by Zoë about participating in the forum highlights:

'I am quite sensitive, I do not take criticism very well. As confident as I seem I'm probably the most insecure really.'

(Zoë, 7/4/2014)

Even though, as previously discussed, OU students are able to determine their own level of participation in online forums, including not to participate at all, Zoë's comments act as notice that online discussion can potentially result in negative affective outcomes that might impinge on students' engagement and achievement. It is therefore noteworthy that four of the interviewees stated specifically that they had found the forum a safe place to ask questions without worrying about receiving a negative response, although



again this should be qualified by the questionnaire data indicating that the forum was not viewed favourably by all students. Amanda commented that ‘you could ask any question without sounding ridiculous’ (9/4/2014) and Lesley stated:

‘I felt completely at ease to write any query or question, I didn’t think ‘I can’t write that, they’re going to think I’m stupid’. I felt quite comfortable that there were people out there who could help me, and yourself’.

(Lesley, 17/3/2014)

Such comments suggest that a climate of mutual accountability was in evidence on the forum, that may be reflective of the kind of soft skills and therapeutic pedagogies developed in their practice by teaching assistants as identified by Hancock (2013). As Lesley indicates, I had a presence on the forum as moderator, and from the outset encouraged and valued a sharing and supportive style of engagement. However, the relative extent to which it was my presence, or the innate professionalism and sensitivity of the teaching assistants who participated, that contributed to the forum being viewed by many students as a ‘safe’ place would require a much more detailed analysis of the interaction throughout the time the forum was open.

Although, as discussed in this section, there are some significant differences between a community of practice as defined by Wenger, and the ‘community for thinking about theory and practice’ of the block, Wenger’s concept nevertheless provides a helpful model for considering the interactions of teaching assistants on the forum.

## 7.11 Summary

This chapter has set out my detailed analysis of the interview data, with consideration where appropriate to the questionnaire and documentary data. The discussion has been wide-ranging and with a degree of overlap. As demonstrated by the identification of

eight key themes, the learning experiences of the teaching assistants who studied the block can be considered as diverse and multi-faceted. In relation to the work of Lave and Wenger, these teaching assistants' learning during the block was seen to be situated not just within their workplace, and their interaction with the block materials and fellow E207 students, but also within the context of their longer-term career and life trajectories. Of the many aspects of 'what it [was] like to be participating' (Parlett & Hamilton, 1972, p. 11) for these teaching assistants, in concluding this chapter I wish to highlight three points in particular.

Firstly, the importance of having the opportunity to engage with mathematics at a theoretical level in giving these teaching assistants' a sense of rigour and authority in respect of their learning came across strongly in the data. For some, the positive impact of their learning appears to have been heightened by the process of reflecting on their previous learning and experiences of mathematics, as well as their current and developing practice.

Second, their newly-developed practice confidence, and ownership and belief in the rigour of their learning has enabled these teaching assistants to develop a degree of personal agency. This has made them feel able to contribute to the development of teaching and learning in their settings, as opposed to seeing themselves as solely learning from 'expert' teachers.

Finally, in describing 'what it was like to be participating' the examples of their practice used by many of the interviewees reinforce the sense that their work with children might often more accurately be described as 'teaching' rather than 'supporting learning'.



## Chapter 8 Conclusion

In this final chapter I return first to each of my two research questions to summarise my key findings and draw out where I consider my study has made an original contribution to knowledge in this field. This consideration then feeds into a summary of implications for professional practice. Finally, this thesis concludes by suggesting four areas identified by the study as meriting further research.

**What are the ways, if any, that studying a work based distance learning block of study has an effect on teaching assistants' confidence and attitudes towards mathematics, and on their work supporting children's learning?**

In most cases students reported positive and productive outcomes from their study of the block relating to confidence in their mathematical ability, their ability to help develop children's mathematical learning, and their attitude towards mathematics as a subject. Additionally, many reported increased professional interactions with teachers.

Adapting Harland & Kinder's (1997) hierarchy provided a helpful framework for identifying what appeared to be the most influential outcomes from the block relating to teaching assistants' practice and pupils' learning, and what might have brought these about. The most prominent outcome relating to their practice was how their study of the block had enabled them to work with children in mathematics in a much more 'fine-grained' way, and my data suggest that this moved them into practices that can be regarded as teaching. The interviewees attributed this to two linked outcomes in particular. First, this shift came about through 'being equipped' as a result of a new depth to their knowledge, understanding and skills, which was a key contributor to the second factor, their increased confidence to address children's specific needs in mathematics. This development of confidence was also linked to other factors including, importantly, how their schools viewed and responded to their university

studies. A further outcome resulting from their increased practice confidence, and ownership and belief in their learning was to enable these teaching assistants to exercise a greater degree of personal agency in their settings. This has enabled them to contribute more fully to teaching and learning, and become less reliant on ‘expert’ teachers for instruction and guidance.

**What is the nature of the experiences that teaching assistants encounter as they study and draw on their new mathematical learning in their school practice and wider experience?** As I proceeded through this study, I questioned the appropriateness of such an established and frequently drawn upon theoretical idea as ‘legitimate peripheral participation’ for helping to interpret the data of an event as time-bound and self-contained as the block. However, as I worked with the data, I became increasingly convinced of the value of doing so, because although the theoretical idea (as set out by Lave & Wenger) may have been insufficiently attuned to reflect fully the situations of the teaching assistants in this study, it threw into focus how their learning during the block was situated in and influenced by not just their workplace, but also to where it was taking place within their longer term careers.

In Section 7.7, the career paths of the interviewees were considered to possess some of the characteristics of a ‘peripheral trajectory’. For some, however, their ongoing development also to some extent was seen to resemble an ‘inbound trajectory’ towards membership of the wider community of qualified teachers. However, it appeared that, for some, their current role was integrated to a much greater extent than others into the professional structures of their school.

An important dimension of ‘being equipped’ is the self-assurance, extending beyond of the requirements of the block, it has given these teaching assistants to approach teacher colleagues with their own professionally informed assessments of individual children’s

learning needs and clear suggestions about how to address them. Especially influential was how engaging with mathematics at a theoretical level infused their learning with a sense of rigour and authority. Not only did six of the interviewees report that this gave them what they felt was a legitimate ‘way in’ (Tanya, 30/4/2014) to approach teacher colleagues, but it appeared that personally mastering or understanding mathematical ideas or techniques they had either previously struggled to grasp or performed successfully without genuine understanding was also a powerful contributor to this development of agency.

Interviewees also attached great value to the material outcomes of their study. The influence they attributed to the reader seems significant for a number of reasons as discussed earlier, but I suggest that in fostering their development of agency, its role as a reference source is especially relevant. ‘Being equipped’, essentially an element of effective teaching, goes much deeper than being told or shown how to do something. For these teaching assistants, the data suggest that it includes knowing they have the wherewithal to prepare themselves, if necessary without the help of a teacher in the role of ‘expert’, for working effectively with children in mathematics, and further to feel confident that the source is imbued with the necessary authority and subject-specific detail to be shared with teacher colleagues.

Practical ideas for mathematics activities shared by other students on the online forum were also highly valued by interviewees. In particular the data suggest that knowing these were ideas that had been used effectively by peers in their own settings was an important factor in this, meaning the forum might be thought of as an alternative community of practice, that for these teaching assistants felt less restrictive and hierarchical than one requiring them to learn primarily from ‘old timers’.

I suggest that ‘revelation’ and ‘affirmation’ were also central to these teaching

assistants' development of agency, by engendering in them a genuine sense of discovery in the three areas identified in Section 7.4:

- understanding particular approaches to teaching mathematics at a conceptual level
- perception of the nature of mathematics as a subject
- appreciation of effective teaching practice

For some, this sense of discovery and the accompanying development of agency may have been heightened due to the influence of their learning territories relating to previous experiences of learning and using mathematics. It therefore appears significant that the block explicitly encouraged students to reflect on their previous learning and experiences of mathematics, as well as their current and developing practice. In doing so I suggest that many were actively constructing new understandings about mathematical ideas, as well as about the nature of the subject itself, thereby taking ownership of their learning and, in various ways, developing personal agency and related practices within their setting. This can be viewed as a very different process to many of the top-down CPD initiatives that were the focus of Harland & Kinder's (1997) study, and many of the programmes of school-based CPD the teaching assistants in this evaluation may have experienced, given the pace of government-led change in primary education in recent years.

### **Contribution to knowledge**

Interviewees frequently referred to their work as 'supporting' children's learning. However, I have suggested in the preceding three chapters that, in many cases, the practice they describe should more accurately be considered as teaching. The interviewees' adherence to the term 'support' may be seen as reflecting its continuing use in wider policy and research relating to teaching assistants (e.g. Blatchford, 2012;

Sharples *et al.*, 2015), in contrast to teachers, who ‘teach’. Clearly there are vested interests here, not least from teacher professional associations. As their title assumes, teaching assistants, officially, are ‘assistants’, and this places boundaries around both the terms and conditions of their employment and what their role is considered to involve. My study challenges this discourse by suggesting that this distinction may be misleading, and that the inbound journeys of significant numbers of teaching assistants may not be receiving adequate acknowledgement and support. It may even be the case that, in terms of official recognition, their moves towards more informed practices are being rendered invisible.

The nature of the teaching engaged in by the teaching assistants in this study, however, is distinct in important ways from that of teachers, in ways that I believe my study provides greater insight into than existing research. As Hancock states, the demands placed on class teachers in today’s schools have resulted in teaching assistants increasingly being expected to take on aspects of dealing with the ‘multiple demands of a large group of children’ (2012, p. 308) by giving time to individuals and small groups of children. An important dimension of this work to emerge from my study, discussed in particular in Sections 7.5 and 7.6, is how ‘being equipped’ in terms of subject knowledge enables them to achieve a balance between the pastoral and therapeutic and what I consider to be the teaching aspects of their role. This may also be relevant to subject areas other than mathematics, and challenges influential current thinking, explored further later in this chapter, that separates out the pastoral and pedagogical dimensions of teaching assistants’ work. Where teaching assistants are expected to provide emotional support within a lesson (as opposed to separately from the curriculum, for example as a learning mentor), it seems essential for schools to ensure they are equipped with the necessary subject knowledge in order to achieve the ‘productive balance’ described by Hancock. This is necessary in order to avoid children



becoming over reliant on them. Clearly time and resource implications come into play here. However, many teaching assistants, through their life experience and existing work in school, have already developed advanced interpersonal approaches, soft skills and therapeutic pedagogies. The findings of this study suggest the confidence that goes hand in hand with feeling properly equipped in relation to subject knowledge may enable these important additional pedagogies to be used appropriately and, indeed, honed further.

The evidence in this study of teaching assistants drawing on their self-initiated study to adopt the role of ‘skilled newcomers’ (Woodgate-Jones, 2012) adds to existing work in this area by challenging, within an educational context, models of apprenticeship and legitimate peripheral participation that focus solely on newcomers learning from experts. As discussed in Section 7.8, the reported experiences of these interviewees suggest that teaching assistants may be able to draw on their study to take on this role to a greater extent than student teachers. This may be due in part to teaching assistants not closely conforming to the concept of a newcomer, although against that, some of the data in this study suggests that the extent to which their voices are listened to in decision making more widely continues to vary considerably between and even within schools. Nevertheless, the nine teaching assistants interviewed reported being able to exercise a significant degree of individual agency linked in particular to their increased practice confidence arising from their study of the Block (see Section 7.6 in particular). The important contribution of ‘revelation and affirmation’, as discussed in Section 7.4, as well as ‘being equipped’ in bringing this about is an aspect of this study’s findings that I suggest all providers of CPD for teaching assistants should take into account in determining the content and nature of such development.

As discussed in Section 7.9, the data suggest that in the two decades since Swann & Loxley’s (1998) research into the OU’s STA programme, there has been a significant

shift in the willingness of some settings to engage with the self-initiated study of their teaching assistants, even though this may still be happening to a greater extent in some schools than others. The accounts of five interviewees suggest that the way in which their potential contribution is perceived within their school has been influenced by the knowledge that they have personally organised and are making good progress with their university study. As explored in Section 7.8 in particular, this apparent greater engagement by the schools represented in this study may be, to some extent, the result of increased recognition of the teaching assistant role at school, local and national level. It might also be, in part, a consequence of the progressive tightening of school budgets, resulting in schools having to be more receptive to what teaching assistants bring with them from their studies, personal experiences and other interests. Either way, it is a welcome development, although not one that should be seen by schools as a substitute for structured and adequately resourced CPD for their teaching assistants. Nevertheless, for a four week block of distance learning, the outcomes reported by the many of the participants in this study are notable, and appear to represent a very positive effect on their practice and relationships in their schools, as well as their wider experience.

## **Implications for professional practice and policy**

Three of the recommendations made in the Education Endowment Foundation publication, ‘Making best use of teaching assistants’ (Sharples *et al.*, 2015), which was discussed in Section 1.4, refer explicitly to equipping teaching assistants with secure subject knowledge and skills. I therefore return to these recommendations now as a helpful starting point for setting out four key implications for professional policy and practice arising from my findings.

First, Sharples *et al.*’s recommendation that teaching assistants ‘should not be used as an informal teaching resource for low-attaining pupils’ calls for schools to ‘rigorously

define' the role of teaching assistants, and that where they are expected to carry out 'an instructional teaching role, it is important they are trained and supported to make this expectation achievable' (2015, p. 17). My data suggest that some schools have further work to do to define the roles and expectations of teaching assistants, and that doing so may enable their skills, knowledge and experience to be drawn upon more effectively. In this recommendation Sharples *et al.* draw a distinction between a pedagogical role for teaching assistants and their involvement in 'non-pedagogical activities' that include 'helping pupils to develop soft skills'. Whilst there are undoubtedly times when it is appropriate for teaching assistants to work with children removed from the prescribed curriculum in this way, my evaluation leads me to suggest that viewing the subject-related and pastoral or therapeutic pedagogies of teaching assistants separately may be detrimental in limiting the time some children spend on curriculum learning as an included member of their peer group. In fact, my data suggest that having secure and confident subject knowledge is essential for teaching assistants to be able to make the most of the pastoral abilities that they might have, and that these should be integrated into children's curriculum learning.

Sharples *et al.*'s second, linked, recommendation is that teaching assistants should 'add value to what teachers do, not replace them' (p. 18). This recommendation advises that over a period of time, teachers and teaching assistants should rotate the groups they each work with to enable teachers 'to work more with lower-attaining pupils and those with SEN', and for this to happen teaching assistants should be 'equipped with the skills to support learning consistent with the teacher's intentions' (p. 18). I feel obliged to ask: are being 'equipped with the skills to support learning consistent with the teacher's intentions' and 'teaching' not, in fact, the same thing? If they are, as many of the examples in this evaluation suggest, then the implications for policy makers and school leaders are considerable. Adequate provision must be made for teaching assistants to

receive the necessary education to develop these skills, and indeed to be allocated sufficient time to plan to teach effectively alongside fully qualified colleagues. My use of the term ‘education’ here as opposed to ‘training’ is deliberate, based on the nature of teaching assistants’ learning during the block and the ways in which this evaluation suggests that their learning has enabled them to move their practice into teaching. I believe that the data in my evaluation add weight to the argument that the differences between the work that teachers and teaching assistants do is in many cases much less clear-cut than these two role titles suggest, and, further, that if what teaching assistants are required to do is in fact teaching, their practice needs to be named as such, supported and remunerated appropriately. Although many teaching assistants may already be teaching effectively without any of these three things happening, leaving this to chance or relying solely on the goodwill or self-study of individual teaching assistants for this to happen is not an acceptable approach.

Sharples *et al.*’s third recommendation concerns helping pupils ‘develop independent learning and manage their own learning’, and also calls for teaching assistants to work in harmony with the methods employed by the teacher, requiring teaching assistants to be ‘trained so they fully understand the principles of the approach and the techniques to apply it’ (p. 18). The need for consistency between teachers and teaching assistant within a classroom is clearly important. However there is a sense in which both this and the previous recommendations require teaching assistants to be ‘trained up’ to comply with methods stipulated by a school. This seems to disregard the prospect that teaching assistants might have their own valuable ideas and insights to offer. Of course, schools are compelled to work within wider policy requirements, but, in my evaluation, the reported appetite of teachers, and in some cases mathematics coordinators and head teachers, to embrace the resources and practice ideas brought from their study by these teaching assistants was considerable. At the OU, sizeable numbers of students continue

to register for modules like E207, and foundation degrees and other qualifications remain popular across the UK. With this apparent appetite for self-study and advancement, and the potential benefits for schools in terms of professional development of individuals and opportunities to refresh and enhance practice, I suggest that there is more scope for schools to consider how they might harness and support their teaching assistants' study. This may be by incorporating aspects of teaching assistants' study into professional development and appraisal processes (as in the case of Zoë's school), or perhaps by facilitating study groups involving teaching assistants from a cluster of local schools or over wider geographical areas through setting up online communities.

In a wider policy sense, I believe that the findings of this evaluation make a compelling case, in an era within the UK of an increasing move towards school-based routes to qualified teacher status, for higher education institutions to continue to play a central role in the professional learning and development of all practitioners. There is a danger, particularly given the time and financial pressures experienced by many schools, that school-based training of teachers and teaching assistants may involve little more than inducting practitioners in prescribed ways of 'delivering' the curriculum. For teaching assistants (some of whom may be on a variation of an 'inbound trajectory' to become teachers), this may be seen on one level as equipping them to fulfill the role expected of them (Sharples *et al.*, 2015). However based on the findings of this evaluation, certainly within the context of mathematics, I suggest that for teaching assistants, feeling equipped goes much deeper than this. It is developed through providing opportunities for exploration, discovery and reflection, including on individuals' past experiences of learning the subject. Whilst it should be possible for these elements to be built into school-based CPD, they are already firmly established in most university provision,

thereby suggesting that a return to schools working in much closer partnership with higher education institutions should be given serious consideration.

Alongside equipping teaching assistants with the skills and knowledge necessary to do what is expected of them, Sharples *et al.*, emphasise that pupils should develop as independent learners and not become over reliant on individual teaching assistants. My final recommendation brings these two aspects together in suggesting that all schools (as some do already) might wish to explore the possibility of allowing teaching assistants to specialise in particular areas of the curriculum to a greater extent. Even within a short block of study, there are examples in this evaluation of teaching assistants reportedly developing confidence and a feel and enthusiasm for mathematics that has enhanced their practice and ability to exercise agency within their setting. Sharples *et al.* state the need for schools to find ‘creative ways to ensure teachers and TAs [have] time to meet’ to improve the ‘quality of lesson preparation and feedback’ (2015, p. 20). I am not suggesting that there will never be the need for a teaching assistant to be assigned to an individual child for a significant part of the school day. However, enabling some teaching assistants to develop a subject specialism has the potential to not only improve teaching and learning support within individual subject areas, but also to ease pressures relating to lesson preparation and feedback, and may help more children to develop greater independence as learners through becoming less reliant on one particular adult.

## **Limitations and lessons learned**

My choice of a questionnaire to gather quantitative and qualitative data from a broad range of students about their study of the block, followed by progressively focused semi-structured interviews with a small subset of these students, enabled me to collect a large volume of rich data that has enabled me to consider my research questions in considerable depth. I acknowledge, however, that the nine interviewees constituted a

self-selecting group. This group included no students whose overall response to the block was negative, and only two whose questionnaire responses indicated that they were relatively less confident before starting the block, whereas four such students would have more accurately reflected the questionnaire data for the cohort. Although the interview data provided illuminating insights into a range of differing experiences of the block, it is possible that the themes I developed from the data may have looked somewhat different with an alternative group of teaching assistants.

Interviewing each teaching assistant twice over a four month period enabled me to probe more deeply on themes that emerged from during the first interviews, as well as allowing further time for the teaching assistants to attempt to draw on their learning from the block in their practice. With hindsight, a more systematic approach to identifying key themes in the data after the first interviews might have added greater focus and depth to the second interviews. Nevertheless, I consider that I was able to analyse and draw on the first interviews in a sufficiently iterative and recursive way to enable 'progressive focusing' (Parlett & Hamilton 1972, p. 20) to take place to a meaningful degree in the second interviews.

In respect of interviews as 'constructed narrative' (Kvale, 2007), I have taken on board the importance of considering carefully what style to adopt when interviewing, including how much of myself to reveal, and to apply this as consistently as possible. This seems particularly important for a study such as this, where power relations come into play, and interviewees may be swayed into saying things that they think the interviewer wants to hear. I also acknowledge that interview data, as 'constructed narrative', is not as reliable as having direct access to the experience of participants, and that the opportunity to observe the interviewees in their schools, and to talk to the pupils and teachers they work with would have been extremely valuable for triangulation of the data.

The interview data collected were substantial, and I endeavoured to be systematic in processing them, and give equal weight to the contributions of all interviewees in developing my thematic analysis. However, I acknowledge that I found this challenging. For example, some interviewees were more engaging and expressive than others, and in selecting extracts from interview transcripts to exemplify points, I found myself being drawn to certain transcripts. Throughout the process I continually monitored my choices in this respect in trying to remain as objective as possible and exemplify particular points with data that I considered to engage most strongly with the research questions, but I recognise that I may have nevertheless inadvertently given greater prominence to extracts of data that support particular arguments over others.

Notwithstanding the above reservations about the interview data, in terms of an ‘illuminative evaluation’ that has aimed to throw light on ‘what it is like to be participating’ (Parlett & Hamilton, 1972, p. 11), it has been very powerful to listen to the voices of these teaching assistants as they talked about their learning, their practice and their lives. Doing so has provided me with deep insights into the important contribution they make to children’s learning and in schools more widely, and the remarkable trajectories they are on. It has been a privilege to be able to listen to their accounts.

### **Recommendations for further research**

Carrying out this evaluation has highlighted a number of areas that merit further investigation. First, further research into the attitudes and confidence of teaching assistants and teachers towards mathematics more widely, together with some case studies on how teachers and teaching assistants work together as teaching teams in mathematics lessons where either or both lack confidence at mathematics would, I feel, be valuable in bringing research in this area up to date.



Second, as stated in Section 3.5.3, the scope of this evaluation precluded a more detailed analysis of students' contributions on the online mathematics forum. However, given the value attributed by interviewees to the forum in respect of their learning, and the potential of this kind of online interaction to engender a productive sense of community, research into students' engagement with the forum on a future presentation of the block would have much to offer both to the existing body of research on asynchronous online interaction, and its potential to contribute to teaching assistants' work based learning.

Third, as stated in Section 5.3, the final study aim of six of the nine interviewees was either definitely, probably or possibly, to become a teacher. Given that the route from teaching assistant to QTS appears now to be a much travelled one, longitudinal case studies of teaching assistants as they proceed through their study towards their final goal, even if is not reached in all cases, may have much to offer to the teaching assistant literature as the nature of the role and the make-up and career trajectories of this workforce continue to evolve.

Finally, the work of Sharples *et al.* (2015) builds on a substantial and influential body of longitudinal research, and makes a number of recommendations about how teaching assistants might be 'used' most appropriately in schools. I believe that my evaluation offers a more nuanced and developed view of the ways in which teaching assistants work and how this is influenced, and often enhanced, by factors arising from their personal and career paths and aspirations. There is a danger, I feel, in a set of recommendations like those put forward by Sharples *et al.* of positioning teaching assistants as a 'teacher-light' workforce that not only underplays the pastoral and therapeutic elements of their work, but also fails to acknowledge that they might have acquired teaching abilities related to subject knowledge. The data in my evaluation suggest that strengthening the subject knowledge and practice confidence of teaching

assistants may enhance their ability to offer pastoral support to pupils. Further research to exemplify and analyse this balance between these two aspects of teaching assistants' work in action will, I feel, be important to help ensure that they are not seen as separate.



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## Appendices



## Appendix A - Extract from E207 Maths Workbook

### Task structure

There are six sections to complete for each task; these are set out below.

#### Activity

State what the learning outcome(s) were for the activity. Your school may have its own term for learning outcomes (e.g. 'learning intention'; 'learning objective'). You may need to liaise with the class teacher to ascertain the learning outcomes for the activity, or you may need to produce appropriate learning outcomes if you will be planning the activity yourself.

Describe what the children were doing. You should include the age of the children, and describe your own role or that of the teacher or other adult in the activity, if appropriate.

#### Children's learning

Describe what you feel the children learned from the activity, or what they found difficult to grasp, if appropriate. Indicate the evidence that led you to form this conclusion. This might include what the children did, wrote down or said.

#### Key mathematical ideas and vocabulary

Outline the key mathematical ideas involved in the activity, with reference to any relevant reading. This may be from your online reading, the Maths Reader or other sources (e.g. online sources, books or resources in your school, national curriculum or guidance documents). You may need to refer to chapters from the Reader beyond those you have been directed to read in the module activities. You must acknowledge the source of your reading.

Try to identify any links with other areas of mathematics.

Identify key vocabulary. Acknowledge the source for any definitions you include.

#### Role of resources/mental imagery

Briefly discuss the role of resources and/or mental imagery in supporting children's understanding. If there was no evidence of this, you should state that this was so and suggest how you feel resources or imagery might have helped, if appropriate. Again, you should refer to relevant reading.

#### Implications for subsequent planning

- What mathematical ideas and vocabulary do you feel the children require further experience of?
- What do you feel the children are ready to move onto next, if appropriate?
- What went particularly well in the activity, and why do you think this was the case?
- What (if anything) would you change next time, and why?

## References

Provide a list of any relevant references.

## Example of a completed task

### 7. Understanding number operations

#### Activity

I supported a group of three eight-year-old children in representing multiplications (e.g.  $5 \times 3$ ) as arrays.

The learning objectives were:

- to understand that multiplication can be carried out in any order
- to improve rapid recall of multiplication facts.

My role was to encourage the children to use a range of relevant vocabulary, and to assess their understanding that multiplication can be carried out in any order.

No resources were provided – the children were asked to draw the arrays in their mathematics books.

#### Children's learning

All three children were able to produce an appropriate diagram of an array from a multiplication presented in written form, e.g. for  $5 \times 3$ :

```
X X X X X
X X X X X
X X X X X
```

They could all explain this as 'five lots/sets/lines' of three, although Jo used the term 'five rows of three'. This was due to her confusion over the terms 'rows' and 'column' rather than misunderstanding of what ' $5 \times 3$ ' meant.

All three children knew that the order of the numbers could be changed to give the same total, and they could all draw an appropriate array to represent this:

```
X X X
X X X
X X X
X X X
X X X
```

Nayeem said 'All times tables can be done the same both ways. The answers are the same.'

The children agreed that the two arrays each had the same number of crosses: 'It's just like the diagram has been turned round' (Jo).

#### Key mathematical ideas and vocabulary

- 1 Multiplication as repeated addition (see Study Guide, Week 7) – this relates to the idea of 'lots of' or 'groups of' (Haylock, 2010, p. 124).

- 2 Image of multiplication as a rectangular array (Haylock, 2010, p. 127). The NRICH (2010) website explains some other useful contexts for arrays (e.g. helping children to learn multiplication facts; exploring factors/prime numbers).
- 3 Commutative law of multiplication – i.e. that multiplication can be carried out in any order (Haylock, 2010, p. 138). I was interested by Haylock's point that although, technically,  $3 \times 5$  means '5 lots of 3', there is no need to make a fuss over how children say or represent it, as it is much more important that they understand that multiplication can be carried out in any order.
- 4 Key vocabulary: 'lots of', 'groups of', 'sets of', 'times', 'multiplied by'.
- 5 Jo's comment about the number of crosses staying the same demonstrates a grasp of conservation of number (Haylock, 2010, p. 33)

### **Role of resources/mental imagery**

The image of the array itself is powerful, as it shows at a glance that e.g.  $3 \times 5$  is the same as  $5 \times 3$  (Haylock, 2010, p. 126). A peg board would be a good 'hands-on' resource to allow children to explore factors – e.g. 'how many ways can you find to make 24?'

### **Implications for subsequent planning**

- Look for opportunities to develop understanding of 'rows' and 'columns'. This could be in data handling or through other subjects (e.g. Science, ICT, Geography).
- Use the image of a multiplication square to encourage the children that, because of commutativity, they already know most of the 'difficult' times-table facts (e.g. 7 and 8).
- The children seemed to like producing a picture for their answer, and I think this definitely helped them to achieve the first objective.
- I have found a computer programme, *Multiplication Array* (DfE, 2011) that would reinforce this visually next time.

### **References**

- DfE (Department for Education) (2011) *Mathematics ITP: Mathematics Array* [online] <http://nationalstrategies.standards.dcsf.gov.uk/node/47787> (accessed February 2011).
- Haylock, D. (2010) *Mathematics Explained for Primary Teachers* (4th edn), London, Sage Publications.
- NRICH (2011) *Multiplication Series: Number Arrays* [online] <http://nrich.maths.org/2466> (accessed February 2011).



## Appendix B - Questionnaire

### Dear student,

This e-questionnaire is about your experience of E207 Block 2 – Mathematics. It includes questions about your study of the mathematics block itself, as well as questions about your general background and experience relevant to your work supporting children and teachers in school. All your responses will be anonymised and will not affect your access to tutorial support or the results of your assessments in any way. Please answer the questions as fully as you can. This should take no more than 15 minutes.

### PART 1 – Your Experience of E207 Block 2 - Mathematics

1. **Before** you started the E207 mathematics block, how confident did you feel about your mathematical ability (both in terms of the subject at your own adult level, and in your role supporting children's learning in mathematics)? Tick ✓ one in each row.

	Strongly agree	Agree	Disagree	Strongly Disagree
I was confident in my own mathematical ability as an adult.				
I was confident in my ability to support children's learning in mathematics				
I had a positive attitude towards mathematics generally				
I was confident when working alongside teachers in a mathematics lesson				
I was confident to make suggestions about mathematics activities and approaches to the class teacher				

2. Please indicate how your study of the mathematics block has influenced how you feel about mathematics (both in terms of the subject at your own level, and in your role supporting children's learning). Tick ✓ one in each row.

	Strongly Agree	Agree	Disagree	Strongly disagree
I am more confident in my own mathematical ability				
I am more confident in my				

ability to support children's learning in mathematics				
I have a more positive attitude towards mathematics generally				
I am more confident when working alongside teachers in a mathematics lesson				
I am more confident to make suggestions about mathematics activities and approaches to the class teacher				

3. How useful to you were each of the following elements of the mathematics block?  
Tick ✓ one in each row.

	Very useful	Quite useful	Not very useful	Not useful at all
The online readings and activities				
The mathematics reader (Haylock)				
The mathematics discussion forum				
Tutor Group Forum activities				
Carrying out activities for the mathematics workbook				
Writing the TMA				
Support from colleagues in school				
Support from family and friends				

4. In the box below please identify and explain any factors that have supported you in using what you have learned from the E207 mathematics block in your classroom practice.

--

5. In the box below please identify and explain any factors that have inhibited you in using what you have learned from the E207 mathematics block in your classroom practice.

--

6. Have you noted any changes in pupils' behaviours, attitudes, attainment and learning which you consider to have resulted from changes in your practice? If so, please describe these in the box below.

--

7. Has your study of the E207 mathematics block had an impact beyond your Open University study and beyond your role in school (for example within your family and circle of friends, any other work roles or your wider community)? If so, please describe this in the box below.

--

## PART 2 – General Background Information

8. Gender    Female ☐    Male ☐

9. Age group   Under 20 ☐   20-30 ☐   31-40 ☐   41-50 ☐   51-60 ☐   over 60 ☐

10. Position in school: which of the following best describes your current post:

Teaching assistant	<input type="checkbox"/>	Classroom assistant	<input type="checkbox"/>
Higher level teaching assistant	<input type="checkbox"/>	Volunteer	<input type="checkbox"/>
Other (please specify in this box)	<input type="checkbox"/>		

11. Please indicate any mathematics qualifications that you have? Please tick ✓ all of those that apply.

No mathematics qualifications	<input type="checkbox"/>	First degree majoring in mathematics	<input type="checkbox"/>
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GCSE/O Level/CSE Grade 1		Further degree in mathematics	
A level, Scottish Higher or equivalent (NVQ/SVQ level 3)		Other (please specify in this box)	

12. Please indicate the age group(s) you are currently working with. Please tick ✓ all those that apply.

Under 5 year olds		7 to 9 year olds	
5 to 7 year olds		9 to 12 year olds	

13. Indicate how long you have been working supporting children's learning in school. Please tick ✓ one of the following.

Less than 2 years	
3 – 5 years	
More than 5 years	

14. Indicate how much time, on average, you spend supporting children's learning of mathematics each week.

None	
Less than 1 hour	
1 – 3 hours	
More than 3 hours	

### **PART 3 Contact Information (optional)**

15. Would you be willing to talk to me on the telephone about your experience of the E207 mathematics block?

Yes ☐ No ☐

16. If you have answered yes to question 15, I will need to be able to contact you. Please leave your name and email address in the box below.

--

Thank you very much for taking the time to complete this questionnaire.

Martin Crisp

## Appendix C – Questionnaire invitation

Dear Student,

As chair of E207 I would like to invite you to complete an online questionnaire about your study experience during E207 Block 2 – mathematics. This invitation is extended to all eligible students registered on the 2013J presentation of E207.

The questionnaire is part of a research project being carried out by Martin Crisp, who you will know as the author of Block 2 and the moderator of the Block 2 mathematics forum. The working title of Martin's research project is:

“An evaluation of a short intensive block of study on mathematics for teaching assistants”

The results of the project will form part of Martin's Doctoral studies, and will also help to inform future module design, particularly in respect of work-based learning within the Primary Foundation Degree and the wider context of the Open University. As well as supporting Martin and the Primary team in these valuable ways, I hope that completing the questionnaire will be a beneficial experience for you in helping you to reflect further on your learning and its application to your practice in school.

I therefore encourage you to complete the questionnaire, which should take no more than fifteen minutes.

All your responses will be anonymised and will not affect your access to tutorial support or the results of your assessments in any way.

<appropriate text and link to take students to the survey site>

Thank you.

xxxxxx xxxxxx

E207 Module Chair.

## Appendix D – Invitation and schedule for the first interviews

Dear

Thank you for indicating your willingness to take part in the discussion stage of this research into the E207 Mathematics Block. The discussion is part of my research project with the working title:

“An evaluation of a short intensive block of study on mathematics for teaching assistants”

The results of the project will form part of my doctoral studies, and will also help to inform future module design, particularly in respect of work-based learning within the Primary Foundation Degree and the wider context of the Open University.

I will be using the following list of questions to guide the discussion. However, I may not follow them exactly depending on your responses and interests; for some areas I may invite you to expand on some of your responses to the questionnaire and some of the things you have written in your assignment and on the mathematics forum rather than ask the question as set out below.

The discussion will last for approximately 30 minutes.

### Questions

1. What did you gain from the Block in terms of resources (e.g. text book; new materials; worksheets; firm ideas for activities)?
2. Did your study of the Block lead to you thinking differently in any ways about appropriate content and teaching of the primary mathematics curriculum?
3. In what specific ways did the block develop your knowledge and understanding of:
  - curriculum content in mathematics
  - pedagogy (teaching and supporting learning)
  - your own learning and understanding as an adult?
4. What key messages did you feel were presented by the Mathematics Block, and how far did these correspond with your existing views? Did your own thinking change in any way in response to these messages?
5. What feelings did you have in response to the Block (e.g. made you feel excited or discouraged)?
6. Did the Block generate the enthusiasm and motivation to implement ideas emanating from your study?
7. Has the mathematics block influenced your practice in the classroom?
8. If there have been any changes to your practice, have you observed any associated changes in pupils' learning and behaviour?
9. What factors have supported or inhibited any impact that your study has had on your classroom practice?
10. What wider influence, if any, has your study had within your setting (e.g. the mathematics coordinator adopting a new resource; colleagues thinking differently about their practice)?
11. What impact, if any, has your study had on your wider experience (for example, within your family and circle of friends, other work roles or in your wider community)?

The discussion will take place by telephone. It will be audio-taped and transcribed. I

will then send you the transcript to check. Your responses will be anonymised in all written outputs.

If you are willing to take part in this discussion, please indicate your consent on the attached form and return it to me. Please also use the form to advise your contact telephone number(s) and indicate two or three convenient times for the discussion to take place.

I hope you will find the experience interesting. I am looking forward to talking with you.

With kind regards

Martin Crisp



## Appendix E – Student Guidance for the written assignment

### Part 2 (1000 words)

Identify and discuss two mathematical ideas, techniques or procedures of which you have developed a better understanding through your work-based and desk-based study during Block 2.

Explain how your understanding has developed and what has contributed to this understanding – for example:

- specific module readings and online activities
- online discussion with fellow students and your tutor
- observing and carrying out activities with children in school
- discussion with your mentor and/or other adults in school
- reading beyond the module materials (e.g. websites, textbooks).

In deciding which aspects of mathematics to focus on, you may wish to choose ideas, techniques or procedures that you identified as areas for development following the audit. These areas should provide you with plenty of scope to demonstrate and reflect on your learning. Alternatively, you may wish to consider aspects of mathematics about which you have always felt confident at your own level, but where your understanding in the context of supporting children's learning has been extended as a result of your study in Block 2. Such areas should provide equally rich focal points for evaluation.

Your evaluation should review the targets you set in TMA01. You should refer to the comments you made in your reflection after carrying out the Maths Audit in Block 1, and to the blog entries you made after comparing your original response to the correct answers within Block 2. You can also refer to Block 2 readings on mathematics and creativity.

As well as the readings and study activities within Block 2, the following sections of Block 1 may also provide helpful reference points for your evaluation:

- 'What is Subject Knowledge?' reading
- the Maths Audit commentaries.

## Appendix F – Email to students ahead of the second interview

Dear

I hope that you are well, and starting to think about relaxing over the summer months.

Thank you for talking to me earlier this year as part of my doctoral research based on students' experience in the E207 maths block. Your contribution was extremely interesting and relevant to my research questions.

As you may recall, I indicated in my original request that I would like to be able to have a follow up discussion with you at the end of the school year in order to find out about the impact of your learning from the block over a longer period, and in the context of you now having completed the whole of E207.

I hope that you are still willing to participate in this way. Following the first round of discussions I have studied all the transcripts, and identified a number of themes, which I have developed into a set of questions. I would like to go through these questions with you along with a few questions following up specific things you said in our first discussion. This second discussion will be more structured than the first – I will work my way through the questions in strict order, having sent the list of questions to you in advance., although I may ask follow questions in some cases. The discussion should last no longer than 30 minutes. As before, I will send you a transcript of the conversation afterwards for you to confirm. The same obligations as before on my part about confidentiality, and your right to withdraw from the research at any time will apply.

For now I attach a schedule of possible dates and times. I will be very grateful if you can indicate two or three times when you will be willing and available to talk to me by telephone. I will then get back to you as soon as possible to confirm the appointment and to send you the list of questions.

Thank you again for your willingness to take part in my research. I greatly appreciate it.

Best wishes

Martin Crisp

## Appendix G – Master schedule for second interviews

1. You described your school as (insert). (as appropriate) Please can you tell me more about its location, size, ethos, intake, number of teaching assistants/learning support staff and approach to supporting development of support staff (CPD).
2. In our first discussion you described how (reference to interviewees responses about children's learning and behaviour). This was still relatively recently after the end of the block. In the time since our first discussion, have you noticed any further changes?
3. In the first round of discussions, one student talked about the block as feeling like a 'safe' place to learn. To what extent did you feel safe in this way, or alternatively did some aspects, or even all of the block take you out of your comfort zone?
4. In the original questionnaire, one student wrote about being 'allowed' to influence lesson planning to 'better support' the pupils. To what extent is this also your experience, and has the extent to which you are able to have such an influence been increased as a result of your study?
5. Some students have talked about how the requirements of the block provided them with a good 'way in' to approaching teachers and contributing more in the classroom. If this was the case for you, has this 'effect' continued since you completed the block?
6. In the first round of discussions, a number of students talked about how their study had led to teachers looking at them in a new light in terms of what they could contribute. Thinking about how teaching assistants are perceived in your setting, to what extent are teaching assistants and teachers viewed as two distinct groups, or do you feel there is there a degree of overlap between the two?
7. How important is it to you to feel that you understand mathematical concepts to the same level as the teachers you work with, and to what extent do you feel that the block enabled you to do this?
8. How does it feel to be able to talk with teachers as an 'equal' in terms of your specific mathematical subject knowledge?
9. You have said that you feel the teachers have perceived you differently as a result of your study of the block. Have you noticed any difference in how the children view you?
10. A lot of students have told us that learning about the counting principles was a particular revelation for them, and that they were able to draw specifically on these to support the children they work with. Was this the case for you? Did this inspire you to look in similar depth into other areas of maths not specifically taught in the block?
11. In the original questionnaire, you stated that you found the tutor group forum activities (insert). Can you say a little more about what was available and how you engaged (or didn't) with these?
12. How would you describe the contribution of your tutor to what you got out of the block?
13. One of the original statements was 'I felt confident in my ability to support children's learning in mathematics'. I'm keen to delve into the idea of confidence a little deeper – what factors do you feel contribute to this confidence?
14. You said that you found Haylock (insert) and that you found (insert) particularly useful/unhelpful. Is there anything else you can think of to say about it?

15. Has your study of the block had any wider impact in terms of your everyday life or within your circle of friends or within your wider community?

## Appendix H - Percentage frequencies: confidence in and attitude towards mathematics before starting the block

	Strongly agree %	Agree %	Disagree %	Strongly disagree %
I was confident in my own mathematical ability as an adult	10.4	46.3	38.8	4.5
I was confident in my ability to support children's learning in mathematics	3.0	62.7	34.3	0
I had a positive attitude towards mathematics generally	19.4	37.3	34.3	9.0
I was confident when working alongside teachers in a mathematics lesson	11.9	68.7	19.4	0
I was confident to make suggestions about mathematics activities and approaches to the class teacher	10.4	37.3	44.8	7.5
N= 67				

## Appendix I - Percentage frequencies: confidence in and attitude towards mathematics after completing the block

	Strongly agree %	Agree %	Disagree %	Strongly disagree %
I am more confident in my own mathematical ability	38.8	55.2	4.5	1.5
I am more confident in my ability to support children's learning in mathematics	40.3	58.2	1.5	0
I have a more positive attitude towards mathematics generally	35.8	56.7	7.5	0
I am more confident when working alongside teachers in a mathematics lesson	40.3	49.3	10.4	0
I am more confident to make suggestions about mathematics activities and approaches to the class teacher	38.8	46.3	14.9	0
N = 67				

Appendix J - Coding, definitions and frequencies for open responses:  
changes in pupils' behaviours, attitudes, attainment and learning

Code	Definition	Illustrations	Frequency
ENG	Increased engagement/ enthusiasm/ enjoyment	‘children have a general higher level of excitement for maths activities’; ‘seem to enjoy maths a little more’	9
COMM	Greater willingness to communicate	‘the children asking me more questions and approaching me more ’; ‘come up to me to ask for help (even outside the classroom) with their maths problems’	3
PERCEP	Change in children’s perception of practitioner	‘the children appreciate that I can support their maths development as effectively as the teacher’; ‘have more confidence in me’	4
UNST- GEN	Increased confidence/ understanding expressed in general terms	‘children appear to grasp concepts a little easier’; ‘feeling more confident and happier’	5
UNST-SPE	Increased confidence/ understanding related to specific mathematical concepts or procedures	‘the number line has helped children in addition’	1

Note – Number of responses that described changes in pupils’ behaviours, attitudes, attainment and learning = 22

Appendix K - Codings, definitions and frequencies for open responses:  
impact beyond students' OU study and role in school

Code	Definition	Illustrations	Frequencies
SUPP-CHN	More confident to support own children's learning	'I am now not intimidated by [my daughter's GCSE] questions; 'I feel more confident to support my own children with their maths homework'	12
CONF-MATHS	Greater confidence in mathematics generally	'I feel more confident in my maths ability. I'm able to do things I couldn't do before'	8
WIDER-SCH	Impact within school beyond immediate role	'All teaching assistants ... have been required to evaluate their mathematical knowledge and strengths and areas for development.'	4
FURTH-STUDY	Motivation to continue further study in mathematics	'Continuing towards my GCSE'	1
OTH-ROLES	Impact on other roles supporting children	'I support a child beyond my role in school ... noticed the confident attitude in his learning since I started using the maths block'	2
FRIENDS	Approached by friends for support with mathematics	'A friend has asked me to help her revise for a numeracy test on her PGCE'	1

Note – Number of responses that identified the block had had an impact beyond respondents' OU study and role in school = 28. One respondents' comment relates to more than one code.



Appendix L - Percentage frequencies: usefulness of individual elements  
relating to the mathematics block

	Very useful %	Quite useful %	Not very useful %	Not useful at all %
The online readings and activities	50.7	41.8	6.0	1.5
The mathematics reader	94.0	6.0	0	0
The mathematics discussion forum	38.8	43.3	14.9	3.0
Tutor group forum activities	16.4	53.7	25.4	4.5
Carrying out activities for the mathematics workbook	62.7	37.3	0	0
Writing the TMA	55.2	35.8	6.0	3.0
Support from colleagues in school	58.2	32.8	7.5	1.5
Support from family and friends	31.3	43.3	23.9	1.5

N = 67

Appendix M - Codings, definitions and frequencies for open responses:  
factors that supported students in using their learning from the block in  
classroom practice

Code	Definition	Illustrations	Frequencies
OPEN-CT	Openness of class teacher to embrace student's learning	'The teacher has encouraged me to put forward suggestions and ... allowed me to alter lesson structure to better support the pupils'	4
OPEN-SET	Openness of setting to embrace students' learning	'I have been released to observe other year groups which has been very useful'	4
UNST-CONF	Student's increased understanding and/or confidence	'I feel more confident in maths terminology and refreshed my general knowledge on the subject'; 'understanding the principles of maths, the how and why'	38
READER	The maths reader	'I have used (the maths reader) to help me plan lessons in a more creative way'	15
FORUM	The maths forum	'I have used the maths forum to clarify certain aspects of maths that I was not quite sure of'	7
AUDIT	The maths audit	'The audit ensured I brushed up on areas I was weak on'	2
FAMILY	Support of family and/or friends	'I had a lot of support from my family'	1

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Note – Number of responses that identified and explained supportive factors in applying learning from the block in classroom practice = 53. Some of the respondents' comments relate to more than one code.

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## Appendix N - Coding and definitions for open responses: factors that inhibited students in using their learning from the block in classroom practice

Code	Definition	Illustrations	Frequencies
TIME	Time constraints	‘teachers just didn’t have much time’	4
NO- INPUT	Lack of input into planning and teaching	‘the teacher does all the planning and I have to follow accordingly’	3
CLASH	Approach of teacher incompatible with E207 block	‘Sometimes my school’s mathematics policy uses different techniques than E207’	1
IRR- PUPIL	Perceived irrelevance of the block content in respect of pupils supported by a student	‘I work in Early Years, and much of the block was beyond the needs of the little ones’	13
WARY	Wary/nervous about making suggestions	‘As a teaching assistant I lack confidence suggesting new materials ... as I am worried of the teachers’ reactions’	2

Note – Number of responses that identified and explained inhibiting factors in applying learning from the block in classroom practice = 22. One respondents’ comment relates to more than one code

## Appendix O – Example of initial coding of interview data

### Extract from second interview with Lesley, 6 August 2014

	Okay, that's great. Thanks very much, Lesley. Moving on to question 2 now, in our first discussion you described how you felt that some of the children you worked with were just starting to make progress in response to how you had developed your practice following the block. This was still relatively recently after the end of the block. In the time since our first discussion have you noticed any further changes?
providing fine grained learning support	Yes, I have. With that particular group because I was able to really use the counting principles because they'd just come into reception. Three children really I've been sort of concentrating on, one's made a really massive but steady progress to the end of the year and has pretty much caught up with the rest of the class which is brilliant for me being able to comment exactly what she can and can't do now and using the proper language, that was great. There's another child, it's quite perplexing, but we've sort of highlighted there may be some special needs there because it's not consistent, she's not able to one to one counting, she's just different every time you do it. And the other child is great, yes, so they've really moved on.
professional effect of using correct terminology	
	Yes, that's good to hear. So moving on now to question 3, in the original questionnaire one student wrote about being allowed to influence lesson planning to better support the pupils as a result of the block. To what extent has this also been your experience?
being given greater autonomy / responsibility	Yes, definitely. Especially with the Maths, because of the work that I was doing in carrying out those activities I worked really closely with the teacher who's now the deputy head using the numbers and patterns and various other government documents for planning. And she could see and you know, she read all my essays and I think she knew exactly what I was doing, how I was doing it, and why and my understanding. So she basically gave me the group and said I'm happy for you to plan and carry out anything you feel is relevant. You know, this gave me free reign on that which was brilliant and often now when she's planning she often asks me for my opinion or I've been often able to give a few ideas of things we can do. So I feel really valued. Also since my last module I've been given PPA cover as well so I'm in charge of the class once a week.
	And how do you feel about that?
Feeling more confident	Much more confident, still a little bit nervous at the moment but I do feel ready for it, definitely, which I wouldn't have been a year ago.
	That's lovely, thank you very much. My next question is linked to the previous one. Some students have talked about how the requirements of the block provided them with a good way in to approaching teachers and contributing more in the classroom. Has this been the case for you and has that continued since the block?
enhancing profile in school	Yes, well, not so much since the block, probably the same response to your other student. Because I was moving around the school, carrying out surveys and discussing topics with teachers. I was observing their lessons and they love talking about what they

	do and why they do it which is great. And because I was able to converse competently I think they probably view me a little bit differently. I feel so much more included in conversations now, but since that module and moving around, I suppose it's that I'm not with the other teachers in other classes. I mean, the class that we're in, we often have discussions but not so much, I'm not moving around so much now.
	That's an interesting response actually, so during the block it helped you to meet people that you wouldn't normally have so much to do with and feel included with them but since the block has finished you've been concentrating more with a particular teacher you're working with.
	Yes. That's right.
	That is interesting, thank you. In our first discussion you talked about how your study had led to one of the teachers you work with looking at you in a new light in terms of what you could contribute. Thinking more widely about how teaching assistants are perceived in your school to what extent are teaching assistants and teachers viewed as two distinct groups or do you feel that there is a degree of overlap between the two?
how teaching assistants are perceived in school	Definitely two distinct groups and it differs from teacher, each teacher. Particularly with the teacher that I'm working with, I'm viewed differently now because of what I'm doing, you know, what they know I'm doing and now she's read all my essays and everything and we often have discussions together, two or three teachers and myself. But I'm still considered a TA but hugely valued, but there are other teachers that only share what they need to share. You know, you're doing this today and with this group and there's no discussion of understanding or exactly what they want the child to get. Different teachers have different ideals on what the TA should be and it's definitely two distinct groups, but usually highly valued.
	That's great. My next question is, how important is it to you to feel that you understand Mathematical concepts to the same level as the teachers that you work with? And so what's the extent you feel the block helped you to do this?
necessary level of SK understanding	It's imperative that I understand the concepts being taught and I support, otherwise I just don't feel equipped to support the students. And that feeling of supporting children on something and not being completely sure is overwhelmingly horrible. Yes, I couldn't stress that enough, if anybody was going to be - like for me thinking about supporting a year 6 class now, because that is a reality to me now. I feel still nervous and would have to make sure, I'd probably look up in Haylock the week before on concepts that we were doing but, yes, it's imperative for me.
	That's great and do you now feel that you're able to talk with teachers as an equal in terms of your specific mathematical subject knowledge to support children.
Feeling equipped	Maybe not an equal, if it was going to be year five or year six, maybe not equal to begin with, I'd need a bit of time to be fully confident there but definitely much more confident and willing and ready and equipped. I feel I know exactly what I need to do to be fully equipped because the sites that we found and the books we were given, I would consider it possible easily.
	Yes, that's great. My next question is, you've already talked about how you feel that numbers of the teachers now perceive you differently as a result of your study of the block, have you noticed any difference in how the children view you?

	Yeah, that's a funny one.
	In terms of, it's perhaps not that easy to pick up on but in terms of when you're supporting them in maths, are they responding to you or viewing you in a different way at all?
effect of confidence on children	I had a good think about that, from taking the Maths group out that I have been, since I've been studying the module I felt that the children were completely focused and their behaviour was good. Whereas had I not been confident I think it may have be slightly different. I felt confident and in control and I was prepared. I'd planned and I was prepared and I knew exactly what and how I was going to do and why, and what I wanted them to get out of it. And I think that comes across to them. I don't think they view me differently, I suppose mainly it comes through in their behaviour because it's linked to pedagogy isn't it?
	Definitely.
	So behaviour-wise and enjoyment perhaps, but yes, that was a tricky one, I had to really really think about that.
	That's a really insightful answer actually, picking up particularly that you've noticed that their behavior and linking that to the pedagogy. I think that's a really interesting response.
effect of confidence on children	I also think that they're definitely more focused and they feel relaxed when you're confident and in control, does that make sense?
	It makes a lot of sense. That's great, thanks very much. Question 9, and you've talked about this already today. You described in the first discussion about how the counting principles had guided you in supporting that particular group of children, I wonder whether this had inspired you to look in similar depth into other areas of Maths that weren't specifically taught in the block.
Extending learning beyond the block	Yeah, the only thing I'd been on Numicon training which apart from coming under visual representation, that's something that I've been researching and using. I don't know if we covered things like subitising in the block?
	It wasn't specifically covered in the block.
	Yes, that's something I've been using alongside visual representations. And using them together for number recognition and understanding number and symbols using lots of different representations together. But that sort of what we covered, that's one of the things that really hit me before, apart from that, no, not really.

## Appendix P - Overview of the nine interviewees

	Age	Highest existing qualification	Maths GCSE: Yes/No	Age group of pupils	Final study aim	Confidence/ attitude before starting block	School's approach to CPD of support staff
<b>Hannah</b>	Early 20s	3 A levels	Yes	9-11	Probably QTS	Very confident and positive	Limited CPD currently in place
<b>Zoë</b>	Early 30s	2 A levels	No	9-11	QTS	'I've still got a dread of maths ... all those years reading, copying answers ... workbooks'	Very structured and proactive
<b>Karen</b>	Mid 30s	2 A levels	Yes	4-11	Foundation Degree	Confident	Limited CPD currently in place
<b>Lesley</b>	Late 30s	2 A levels	No	5-7	Degree, possibly QTS	'absolute dread and embarrassment and fear and negative emotions' about supporting primary age children	Teaching assistants are encouraged to apply for CPD, but it is not always forthcoming
<b>Amanda</b>	Late 30s	NNEB	Yes	Nursery; also home-work club with all ages	QTS	Confident and positive about maths, in contrast to difficulties with English as a result of being dyslexic	Proactive and supportive
<b>Tanya</b>	Early 40s	GCSE (O level)	Yes	Mainly 10-11	QTS	Very confident	Proactive and supportive
<b>Steph</b>	Early 40s	GCSE (O levels)	Yes	4-11	Degree, possibly QTS	Very confident	Very supportive

<b>Susan</b>	Late 40s	NVQ level 3	Yes	Nurs- ery	Degree	Fairly confident	Nursery manager – responsible for own CPD
<b>Gina</b>	Early 50s	3 A levels	Yes	7-11	Degree	Confident	Proactive and supportive

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